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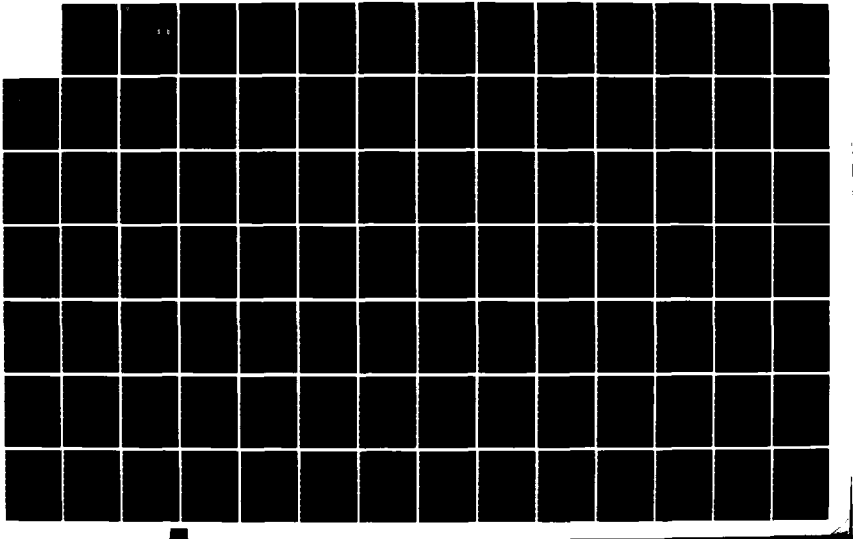

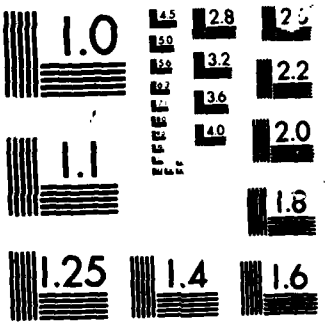

US Army Corps
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Engineer Institute for
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The McClellan-Kerr Waterway and Regional Economic Development - Phase II Study -

Final Report

November 1985

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This study presents estimates of the economic development impacts due to the savings in delivered costs of commodities transported on the navigation system. Description of the multi-regional variable input/output model's formulation, calibration, and implementation is presented.

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The McClellan-Kerr Waterway and Regional Economic Development
-Phase II Study-

Final Report

Submitted to the U.S. Army Engineer
Institute for Water Resources

By

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November 1985 Contract Report 85-C-5

FOREWORD

This report presents estimates of the economic development impacts due to savings in delivered costs of commodities transported on the McClellan-Kerr Arkansas River Navigation System. The multiple-region variable input/output model is ~~employed~~ used to generate the estimates of project impacts. This model presents a national view of development impacts from this transportation system. From $50 million transport savings in 1978 the model estimates that 454 additional jobs were created in the 26 waterway counties in Oklahoma and Arkansas, 337 additional jobs were created in the rest of Oklahoma and Arkansas and 1,929 jobs were created in the rest of the U.S. These results make a potentially important contribution to the understanding of the way that transportation projects influence economic development. Far more jobs are created in those areas which receive the savings in delivered costs. Thus waterway projects should be viewed as contribution to widespread development impacts. If more "local" development impacts are sought, other projects should be sought.

This model has been used to generate estimates of the development impacts due to the flood control, hydropower, and recreation features of the McClellan-Kerr Arkansas River Navigation System. Other applications have included the Coosa River Navigation Project (Alabama) and the Oklahoma Water Resources Plan.

JAMES R. HANCHEY
Director
Institute for Water Resources

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Chapter 1

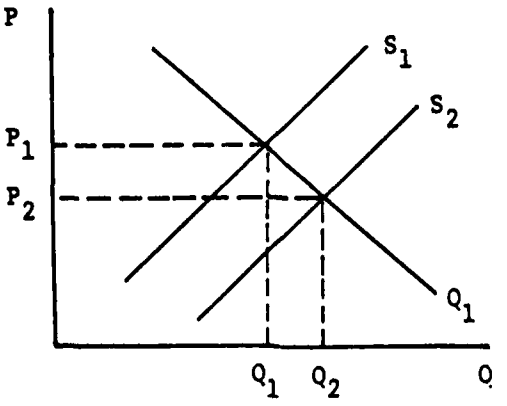
Introduction

(1.1) Explanation of this Study

This is the second part of a study which evaluates the economic development impact of the waterway (the McClellan-Kerr Arkansas River Navigation System).

The development we are interested in, is the increase in output by industry sector directly using the waterway and in output by these industries indirectly affected due to the interaction among industries. The waterway decreases costs to users over alternatives or it would not be used. Decreased costs lead to increased output.

Figure 1 shows the simplest case. A given industry finds transportation cost to be lower, shifting its supply function S_1 to S_2, thereby increasing equilibrium output from Q_1 to Q_2.



(Figure 1)

The navigation system is a large multiple purpose river basin development project which includes 3 major upstream lakes, 4 main stream multiple purpose dams and 14 single purpose navigation dams. Eighteen (110 ft. by 600 ft.) locks provide access between the Mississippi River and Catoosa (near Tulsa) Oklahoma, a route of about 458 miles.

One result is that the shipping cost of many commodities are lowered by the waterway. The system also provides water and electricity supplies and offers water related recreational facilities. The upstream dams substantially lower the risk of the potential flood damages to the riverside communities.

The navigation system provided other benefits; the $1.2 billion construction related spending directly and indirectly stimulated both regional and national economies. More jobs and income were created because of the construction spending. Kim (1977) estimated that the construction spending increased national industrial outputs by $6.4 billion (1963 constant dollars) and the income by $2.1 billion. About one half of increased output and about one third of the income is accrued to the waterway area.

Recreation attendance at the waterway has rapidly increased from 9.4 million visitor days (mvd) in 1970 to 23.2 mvd in 1976, a 20.97% regional increase.

A sample survey by Oklahoma State University (Badger, et. al. (1977)) indicates that a visitor spends approximately $9.50 per day. It implies that the recreation-related expenditure in 1976, for example, was $220.5 million. This spending further stimulated the regional and national economies through the multiplier effects. Over 5800 new recreational homes have been developed around lakes and along the waterway. Recreation users have invested about

$11.5 million in recreation equipment in 1974-75. Table 1.0 provides summary of impact estimates of McClellan-Kerr Arkansas River Navigation System. Recreational impacts were surveyed by Badger et al (1977) and its direct and indirect impact was estimated by Antle (1979). Flood damage has been reduced on an average about $10 million per year since the project was dedicated in 1971. Bank erosion loss has been decreased by about $7 million each year.

The waterway also offers efficient and cheaper transportation service. The waterway, paralleling with the highway and railway, provides firms easy access to the national markets and to the sources of the raw materials. A relatively inexpensive local wage and tax structure further encouraged the relocation of industries to the water regions.

A University of Oklahoma survey (Kerr-Foundation (1977)) shows that cheap labor and land, easy accessibility of markets and raw materials, lower transportation cost and favorable living conditions were the most important factors affecting manufacturing locations in the water region. During 1970 to 1975, 144 manufacturing plants expanded their facilities and 353 new plants were relocated in the water region. More than 40% of these new plants considered those factors important in their decision to relocate the plants in the water counties. The development impact of the cheaper labor and land cost was quantified by Liew-Liew (1980a, 1980b).

The water counties in Oklahoma and Arkansas experience shift from net out-migration to net inmigration in the 1960s. During 1950-60, the water counties lost 98.6 thousand people through out-migration. However, during 1970-75, 53.3 thousand people migrated into the water counties.

The water counties have grown faster than the rest of the U.S. During the recession years 1974-75, the industrial output in the water counties was down only 0.47% while the U.S. experienced severe contraction, down 3.53%. Indus-

(Table 1.0)

Summary of Impact Estimates
McClellan-Kerr Arkansas River Navigation System

Type	Period of Estimates	Source
Transportation Demand/Savings	1970-1978	IWR derived from surveys conducted by Resources Mgmt Project Inc.(1978) Richard Bigda Associates (1978) University of Missouri Rolla (1978)
Recreation	1970-1977	Oklahoma State University (1975)
Hydropower	1970-1974 (1975)	Southwestern Division
Flood Control	1970-1978	Southwestern Division 1980 and Little Rock Districts (1970-78)
Economic Development Impacts due to	1970-1976	
Transporation Savings	1974-1978	University of Oklahoma 1980
Recreation	1974-1975	Oklahoma State University 1975
	and 1978	Oklahoma State
	1970-1978	University (1978) Antle (1980)
Construction	1958-1970	Catholic University (1975)
Environmental Impacts		
Arkansas	1970-1976	University of Arkansas (1980)
Okhahoma	1970-1977	Al Young Associates, 1979
Social Impacts		
Population and Migration	1960-1974	University of Missouri and Columbia (1975)
Small Urban Areas	1960-1974	Dr. Annabelle Motz (1975)
Public Sector Response	1960-1976	Texas A&M University 1980

trial growth rates of the water counties during 1974-78 are higher than those of the rest of Arkansas and Oklahoma or those of the rest of the U.S. with the exception of 1976.

(Table 1.1)

Annual Change in Industrial Output by Region
(1974 base year) (Unit: percent)

	YEARS			
Regions	1975	1976	1977	1978
Water Counties	-0.47	6.38	9.13	18.54
Rest of Arkansas and Oklahoma	-0.01	3.39	5.73	18.41
Rest of the U.S.	-3.53	6.44	6.49	16.79

Source: Center for Economic and Management Research, The University of Oklahoma.

economy of the water counties, the state of Oklahoma and Arkansas, and the U.S. has been favorably affected by the waterway. The waterway has contributed significantly to the regional growth by offering an easy access to outside markets for their sales and purchases of outputs. Since the waterway counties trade with the rest of the U.S., the impact filters directly and indirectly to the rest of the nation.

Waterway shipment has gradually increased from 4 million tons in 1970 to 10 million tons in 1978, a 10.7% compounded annual increase. Heavy and bulky items such as rock, sand, gravel, iron and steel, chemicals, petroleum, grain products, and coal were popular commodities shipped by the waterway transportation.

The shipping decision involves more than the cost consideration. The speed of delivery, availability of modes, quality of shipping service, hazard

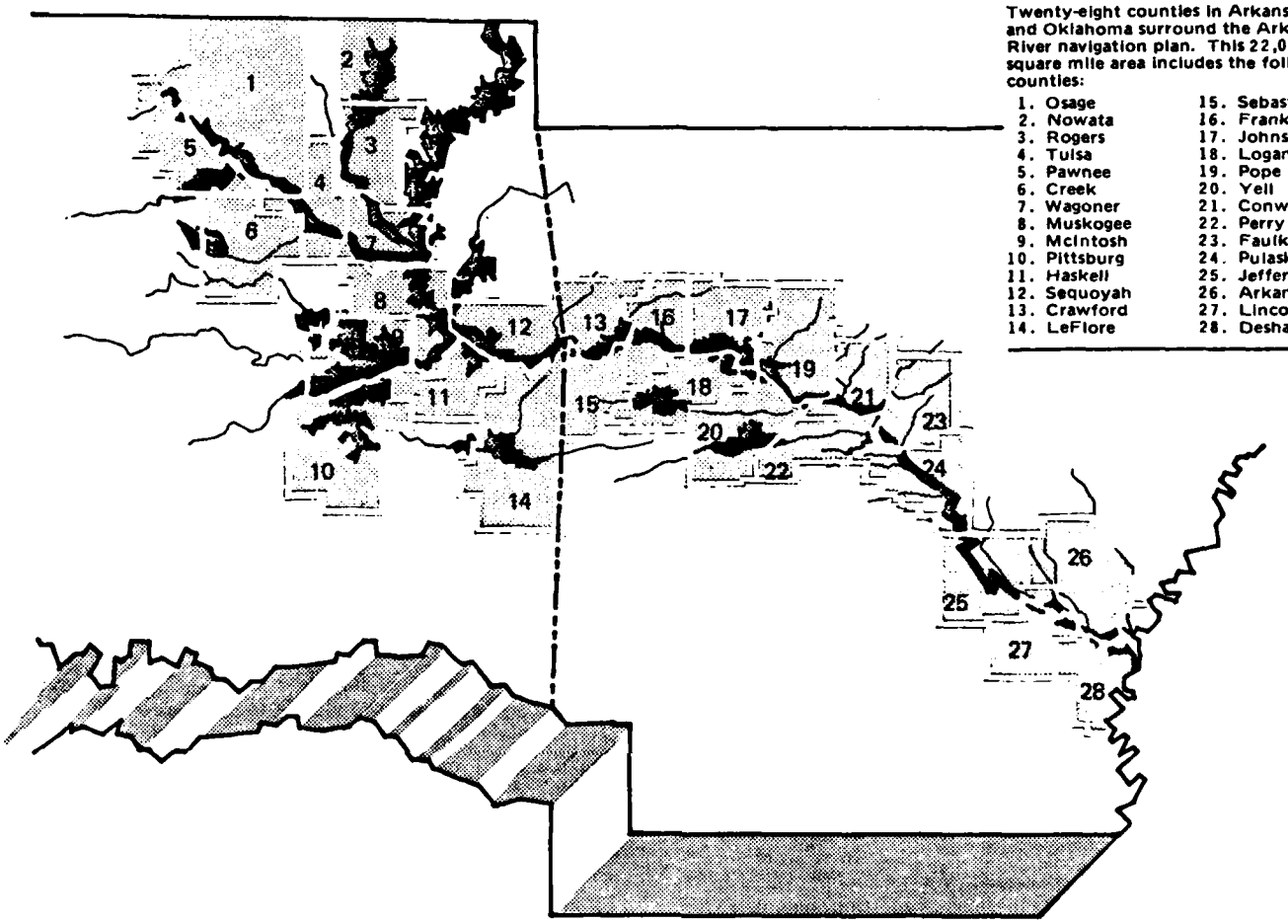
and fragility of merchandise, and value of shipments influence the shipping decision. Therefore, small lightweight products are usually shipped by trucks, while excessively heavy and bulky items are carried by the waterway, and railways usually handle moderately heavy and intermediate size items. But many factors can combine to result in truck and rail, carrying heavy and bulky contents. Therefore, waterway shipment may complement or substitute for other modes. For example, inland-located plants use trucks for parts to haul and the waterway for the rest because this combination provides the best and most economic service. The complementary nature of water and truck modes stimulates development of both waterway and highway system. One of the significant development in the waterway area has been development of an interstate and toll road system paralleling the waterway, essentially in the same area where the waterway was developed. These development has probably diverted traffic from rail. However, it will be shown that increase in rail traffic due to increased industrial output replaces much of the traffic and provides higher revenue products to be carried by rail and truck.

This study shows how the lowered transportation cost stimulates the economies of the water counties, the rest of Oklahoma and Arkansas, and the rest of the U.S. The Phase I Study (Liew-Liew (1980a)) introduced a multiregional variable input-output model and analyzed the economic impact of the lowered transportation costs on the regional and national development.

The three-region ten sector model in the Phase I Study was based on the 1963 interindustry and interregional flow data compiled by Kim (1977). The Phase I Study employed a hypothetical transportation cost change for the economic simulation. The study demonstrated that a change in transportation cost changes the regional trade pattern and the industrial structure of all three regions. Changes in structure occurs as using industries substitute

Map 1

REGIONAL CLASSIFICATION FOR THE MRVIO MODEL



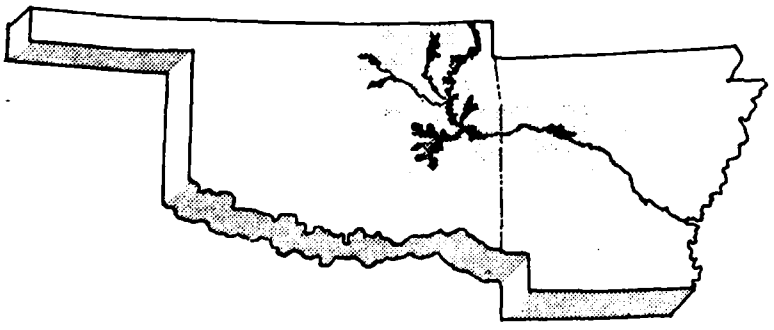
1. THE WATERWAY COUNTIES

Twenty-eight counties in Arkansas and Oklahoma surround the Arkansas River navigation plan. This 22,000-square mile area includes the following counties:

1. Osage	15. Sebastian
2. Nowata	16. Franklin
3. Rogers	17. Johnson
4. Tulsa	18. Logan
5. Pawnee	19. Pope
6. Creek	20. Yell
7. Wagoner	21. Conway
8. Muskogee	22. Perry
9. McIntosh	23. Faulkner
10. Pittsburg	24. Pulaski
11. Haskell	25. Jefferson
12. Sequoyah	26. Arkansas
13. Crawford	27. Lincoln
14. LeFlore	28. Desha

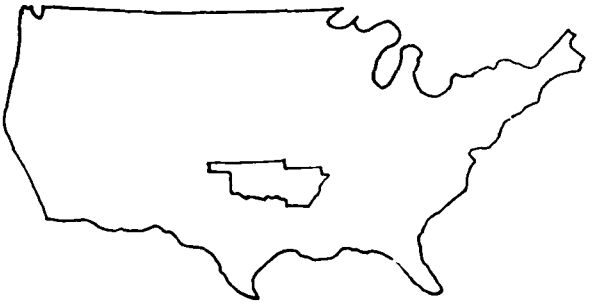
2. THE REST OF OKLAHOMA AND ARKANSAS

The remainder of Arkansas and Oklahoma



3. THE REST OF THE U.S.

The remainder of U.S. and District of Columbia



more of those inputs whose costs have decreased via transport savings.

The Phase I Study provided interesting insights for transportation planners and decision makers about the development potential of the lowered transportation cost on regional and national economies. It also demonstrated the workings of the multiregional variable input-output model.

The waterway system was open for navigation to Catoosa in early 1971. The waterway reduces shipping costs for the heavy and bulky items such as grains, chemicals, iron and steel, rock, sand, petroleum, and coal. How much does the lowered transportation cost contribute to the regional national development? To answer the question, the base year 1963 were updated to the 1972 level, and the industries were further disaggregated into 35 sectors. The thirty-five industrial classifications cover every important industry in the region. The regional classification has been changed from the Phase I Study so that it reflects finer details of the economy of the water region. The Phase I Study employs three OBE areas (117-119) as region 1, the rest of the Southwest (Oklahoma, Arkansas, Louisiana, Texas) as region 2 and the remainder of the U.S. as region 3.

The Phase II Study defines the 28 waterway counties as one region, the rest of Oklahoma and Arkansas as another region, and the remainder of the U.S. as the third region.

A reliable estimate of the lowered transportation cost is the most important input for accurate estimation of its development impact. The Phase I Study simulated the multiregional variable input-output model under hypothetically chosen value of the transportation cost change. This study estimated the costs of transportation with and without the waterway transportation, and calculated the percent change in transportation cost by sector and region.

The waterway statistic series published by Corps of Engineers annually show complete statistics by commodity and waterway. Two Tulsa consulting

firms in Oklahoma (Resource Management Inc. and Richard Bigda Associates) and University of Missouri, Rolla, Missouri conducted surveys on the shipments which utilized the waterway and other transport modes. They gathered information on tons shipped, transit time, value of shipment, mode chosen, rate per ton-mile, handling cost, hauling distance and origin-destination.

Transportation cost is defined to include hauling, handling and time costs. Transportation cost saving by waterway transportation over the most competitive alternative modes was computed for each commodity for years of 1978 to 1974. For example, wheat is the major item in grain sector carried by the waterway transportation. During 1978, the transportation cost saved by the wheat was estimated $1.39 million. Half of the saving ($695 thousand) was made by shipment originating in waterway counties to the rest of the U.S., and the remaining half was saved by the shipment originating in the rest of Oklahoma and Arkansas to the rest of the U.S. The total value of grain transaction from the waterway counties to the rest of the U.S. was approximately $165.2 million. Therefore, the transportation cost saving for grain shipment from the water counties to the rest of the U.S. was computed to be a 0.4207 percent, (= 100 x 695/165200), or about one half of one percent of the value of grain shipped from the waterway counties to the rest of the U.S. in 1978.

(Table 1.2)

Transportation Savings as a Fraction of Shipment Value

(unit: percent)

Commodity	Origin	Dest.	1978	1977	1976	1975	1974
Grain Farm (5)*	1	3	0.42	0.11	0.36	0.25	0.24
Oil Bearing Crop Farm (6)	1	3	1.54	1.87	1.73	1.49	1.21
Chemicals (14)	1	3	6.37	4.48	4.07	4.11	4.72
Petroleum (15)	2	3	0.67	0.79	0.56	0.22	0.40
Primary Metal (19)	3	1	0.50	0.62	0.34	0.39	0.12
Coal (25)	2	3	5.17	2.29	1.09	0.79	1.37
Other Mining (27)	1	3	8.53	15.47	9.19	8.43	27.52

*The figure inside the parenthesis is industry number.

Aggregates which belong to other mining have substantial reduction of transportation cost by the waterway shipment (26%∿50% transportation cost savings), followed by coals (0.8%∿20%), chemicals (0.8%∿9.3%), primary metal (0.036%∿0.67%), and petroleum (0.16%∿2.7%).[1]

How does this change in transportation cost affect the national and regional output? To answer this question, we present an underlying relation between transportation cost and industrial output.

The output in the multiregional I-O model is determined by the following balance equations; i.e.,

$$x = (I-TA)^{-1}Ty \qquad (1\text{-}1)$$

where x is a vector of regional output;

T is a trade coefficients matrix;

A is a regional technical coefficient matrix;

y is a vector of all regions "final demand received."[2]

As an illustration, we consider 1972 trade coefficients (T) of chemical goods (industry 14), their final demand received (y), and their final demand shipped (F).

$$\begin{pmatrix} 12.58 \\ 94.70 \\ 17343.72 \end{pmatrix} = \begin{pmatrix} 0.02355 & 0.0176 & 0.0003 \\ 0.1289 & 0.1212 & 0.0027 \\ 0.8476 & 0.8612 & 0.9970 \end{pmatrix} \begin{pmatrix} 134 \\ 258 \\ 17059 \end{pmatrix}$$

$$F \quad = \quad T \quad y$$

The trade coefficient denotes that 2.3% of chemicals consumed in the water counties was from local chemical company, 13% of them was from the rest of Oklahoma and Arkansas and 84.7% was from the rest of the U.S. The waterway lowers the transportation cost which in turn changes the trade coefficients.

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[1] Details of transportation cost saving are in Table 6.4 in Chapter 6.

[2] Following Moses' (1955) terminology.

For example, the 1978 trade coefficients of chemical products associated with the lowered transportation cost become;

$$\begin{pmatrix} 0.02358 & 0.01693 & 0.00033 \\ 0.12905 & 0.12139 & 0.00266 \\ 0.84737 & 0.86168 & 0.99702 \end{pmatrix}$$

It is evident either F or y should be altered to maintain the balance equations (F=Ty). We assume that final demand shipped (F) is fixed and final demand received (y) is varied because it is more likely that the endusers will adjust their consumptions when trade coefficients chanp

(1.2) Methodology

The transportation facilities and services available in a region play a crucial role in promoting regional development and trade flow. The economic impact of the McClellan-Kerr Arkansas River System is not confined to the waterway counties. The impact is evident in all areas which trade directly or indirectly with the waterway system. Land use, industrial location, interindustry flow, physical distribution of goods, market structure, employment, and interregional trade flow are directly and indirectly affected by the navigation system and services.

The multiregional variable input-output model (MRVIO) introduced in this study investigates the interrelationship between the navigation system and its regional impact. The model requires input elasticities and technical progress coefficients as input parameters. The input parameters for the Phase II study were estimated from the 1972 I/O tables and various census materials. Under the Cobb-Douglas production frontiers, the value share after tax becomes the input elasticity. The technical progress parameters were obtained from the input elasticities. The exogenous variables of the model are transportation

cost, wage rates, service price of capital, tax rates, and final demands. The transportation costs include both terminal, linehaul, and time costs. Input parameters and exogenous variables determine the endogenous variables: output, income, employment, regional technical coefficients, trade coefficients, industrial prices, and various multipliers. These variables can predict many variables of policy interest such as regional growth, development, and industrial locations; structural changes of industries; trade flow patterns; physical distribution of goods; and regional inflation. Table 1.3 shows details of these relationships, however this study will concentrate on the impact of lowered transport costs due to the waterway on regional and national development for the period of 1974 to 1978.

The MRVIO model is consistent with the well-developed theory of firms. The basic hypothesis of the model is that firms are sensitive to cost change. A change in one input cost will result in a remix of inputs in order to maximize profit. A change in input composition and output distribution will alter regional technical and trade coefficients . Unfortunately, the conventional multiregional input-output models assume a fixed regional technical coefficient and a fixed trade coefficient.[1] These technical and trade coefficients enter the conventional input-output model as fixed parameters. In our analysis, the technical and trade coefficients are endogenous variables to the model.

The Arkansas Navigation System has provided energy-efficient transportation services to industries located in the waterway region. These industries can buy and sell within a large market area at relatively low costs. The navigation system not only lowers the cost of inputs, but also encourages outside industries to relocate in the waterway region. Easy access to the waterway

[1]Exception is Leontief-Strout's gravity model (Leontief-Strout (1963)). The model assumed affixed regional technical coefficients. However, the trade coefficients are endogenously determined by the gravity model.

TABLE 1.3

Composition of the

Multiregional Variable Input-Output Model (MRVIO)

Policy-Sensitive Issues	Exogenous Variables	Input Parameters	Endogenous Variables	Policy-Interest Variables
a) Transportation system, facilities, and services, such as	Transportation Costs (composite index)	Input Elasticities	Industrial Output, income	Regional Growth, Development, and Industrial Location
i) Highway Construction	Terminal Cost	Technical Progress Parameters	Employment and Population	Pressure for change in Land Use
ii) Waterway Construction	Linehaul Cost		Regional Technical Coefficients	Substituting Behavior of firms, Structural Change, Industrial Mix
iii) Rail Abandonment	Time Cost			
iv) Subsidy to Rail System			Interindustry Transaction	Market Structure
b) Resource Shortages, such as				
i) Fuel Shortage			Trade Coefficients	Spatial Nature of Trade Patterns
ii) Shortage of other resources			Interregional Trade Flows	Physical Distribution of Goods among Regions
c) Labor Management Disputes	Wage Rates		Industrial Prices	Regional Inflation
d) Foreign Demand	Final Demands		Price Multipliers	Identification of the Sources of Regional Cost-push Inflation
e) Tax Reforms	Tax Rates Other Exogenous Input Costs		Output, Employment, and income multipliers	

encourages the product mix in favor of purchasing inexpensive materials from a wide area. This optimizing behavior of firms is reflected in the MRVIO model.

The model is derived from the dual relationship between the production frontier and the price frontier. Any cost-minimizing input or output quantity can be expressed in terms of the input prices. The price frontier is obtained by replacing the quantity variables in the production frontier with the equilibrium price variables. The price frontier is expressed in terms of input elasticity, transportation cost, wage rates, service price of capital, and technical progress parameters. A change in transportation cost will change the profit-maximizing price level which in turn determines the regional input-output coefficients and the trade coefficients. Industrial output, income, and employment in each region identify the industrial location, land use patterns, and regional growth. The trade flow identifies the physical distribution of commodities and the regional market structures. The model answers many policy-sensitive questions. It measures the impact of the waterway on regional development and predicts industrial location, interregional trade flow, interindustry purchases, and market structure of industrial sales. In the present study, the model was employed to determine the influence of lowered transportation costs, due to the waterway, on regional economic development; but it could be employed to measure the impact of other transportation services.

The potential advantages of this model were documented in previous research (Liew-Liew (1980a, 1980b)). Finally, the MRVIO model is relatively inexpensive to construct since most of the data can be obtained from secondary sources; i.e., published data.

(1.3) Summary of Development Impact

The U.S. economy was divided into three regions; the first region is the waterway counties which include 28 water counties in Oklahoma and Arkansas.

The second region comprises the remaining counties of Oklahoma and Arkansas. The last region is the rest of the U.S. (the remaining 48 states and District of Columbia).

The industry in each region was disaggregated into 35 industrial sectors. This classification represents the details of industrial structure of each regional economy.

The waterway lowers the cost of transportation. The lowered transportation cost reduces sales price of industrial outputs and the lowered price expands its markets. The enlarged market stimulates industrial production, employment, and personal income.

The lowered transportation cost stimulated U.S. industrial output by $118.82 million per year over that which would have occurred without the project during the sample period of 1974-1978. The waterway counties and the rest of Oklahoma and Arkansas have gained approximately $20 million of industrial output each, and the rest of the U.S. $79 million. The expanded output generates more value added and personal income. Total U.S. personal income was increased by 34.26 million because of the lowered transportation cost. The waterway counties and the rest of Oklahoma and Arkansas both gained more than 5.7 million of personal income each, and the rest of the U.S. $22.8 million.

Average transportation cost saving per year was approximately $38 million during the sample period. This $38 million transportation cost savings resulted in industrial expansion of $119 million, making the output-transportation cost saving ratio approximately 3.13. Transportation cost savings vary over year, ranging from $51.5 million in 1977 to 22.7 million in 1975. Impact on industrial output differs year to year because of (1) the magnitude of transportation cost savings and (2) the composition of commodities involved in the transportation cost savings. In general, the larger the transportation

(Table 1.4)

The Industrial Impact of the Lowered Transportation Cost

(Unit: Million current dollars)

	1978*	1977	1976	1975	1974	Average
1) Waterway Counties	27.54	22.64	17.06	13.36	18.50	19.82
2) The Rest of Arkansas and Oklahoma	24.82	22.71	18.00	15.00	20.07	20.01
3) The Rest of U.S.	102.00	89.95	66.58	63.16	72.70	78.87
4) Total U.S.	154.86	135.30	101.64	91.52	111.27	118.82
5) Transp. Cost Savings by the Waterway	50.06	51.51	32.20	22.76	33.21	37.95
6) The Ratio ((4)/(5))**	3.08	2.63	3.15	4.02	3.35	3.13

*Medium estimate

**Ratio of total industrial impact to transportation cost saving.

cost was saved for the year, the greater the industrial output was expanded in the economy. In 1975, the industrial impact was the smallest among five sample because the transportation cost saving was minimal in that year. However, the industries which had largest transportation cost savings did not necessarily increase output most. The importance of the composition of transportation saving is shown, for example, in large transportation cost savings in 1977, but in the year's industrial output increase was smaller than in 1978. The industrial output was stimulated by $135.3 million in 1977 which was smaller than $154.36 million of 1978. The 1977 transportation cost saving was $51.51 million which is slightly higher than $50.06 million of 1978.

The ratio of industrial expansion to the transportation cost saving varied over the sample period largely because of the composition of commodities involved in transportation cost savings. The ratio becomes as high as 4.02 in

in 1975 and as low as 2.63 in 1977.

What are the industries whose transportation cost (tc) is more sensitive to the industrial output? A closer look reveals that chemical products and primary metal products have a strong industrial impact when they are traded with the rest of the U.S.

(Table 1.5)

Percentage of Transportation Cost Savings
by Chemical and Primary Metal Products **

	1974	1975	1976	1977	1978
The percent of t.c. savings accruing to chemical and metal shipment out of total t.c. savings by all commodities.	18.27	23.80	19.37	17.86	21.70
Output to t.c. saving*	3.35	4.02	3.15	2.63	3.08

*The ratio of expanded industrial output to the corresponding transportation cost savings.

**For example, the 1975 figure was computed as follows:

(1) total tc savings to chemical shippers	$ 4787 thousand
(2) total tc savings to primary metal shippers	$ 1312
Subtract:	
(3) tc savings by chemicals which wasn't traded with the rest of the U.S.	-664
(4) tc savings by primary metal which wasn't traded with the rest of the U.S.	- 14
(5) total (1)+(2)-(3)-(4)	$ 5421 thousand
(6) tc savings by all commodities	$22766
(7) the percentage (5)*100/(6))	23.80%

The year 1975 which has the highest percentage of transportation cost (tc) savings by chemical and primary metal products (23.80%) yielded the largest output to tc ratio. Similarly, in 1977 when this percent is the smallest among five sample, the output to tc ratio becomes the smallest among sample. The output to tc saving ratio may depend on many other factors such as the trade structure, the industrial structure, and spatial patterns of market. However, the table (1.5) clearly indicates that output changes are very sensitive to transportation savings by either chemical product or primary metal product.

What are the industries which were benefitted most by the waterway transportation?

In the waterway counties, other mining (sand, gravel, crushed rock, bauxite) is the most conspicuous gainer because of the waterway transportation. Coal, chemicals, petroleum, primary metal, rubber, and grain also show strong gains during the sample period.

In the rest of Oklahoma and Arkansas, grain and other farm alternate the top gainer spot. Chemicals, petroleum, primary metal and rubber are other top gainers due to the waterway transportation.

In the rest of the U.S., chemical industry becomes a commanding gainer, followed by primary metal, service, other mining, petroleum, and utility service.

Table (1.6) shows the impact of the waterway on industrial output for selected industries in each region.

(Table 1.6)

Increase in Output by Sector and Year

(Unit: Million current dollars)

Years	Water Region		Non-water		The Rest of the U.S.	
1978	Other Mining	(5.64)	Grain	(3.76)	Chemicals	(53.02)
(medium)	Coal	(3.19)	Other Farm	(3.67)	Primary Metal	(11.81)
	Chemicals	(2.60)	Chemicals	(2.97)	Service	(5.92)
	Petroleum	(2.30)	Petroleum	(2.66)	Other Mining	(5.39)
	Primary Metal	(2.15)	Rubber	(2.30)	Utility Srvc.	(4.28)
1977	Other Mining	(5.88)	Grain	(3.15)	Chemicals	(44.73)
	Petroleum	(2.06)	Other Farm	(3.06)	Primary Metal	(12.39)
	Primary Metal	(1.92)	Chemicals	(2.65)	Other Minings	(7.06)
	Chemicals	(1.59)	Petroleum	(2.53)	Service	(4.87)
	Rubber	(1.58)	Rubber	(1.88)	Petroleum	(3.08)
1976	Other Mining	(3.74)	Grain	(2.67)	Chemicals	(39.50)
	Petroleum	(2.29)	Other Farm	(2.67)	Primary Metal	(6.25)
	Rubber	(1.37)	Petroleum	(2.16)	Service	(4.15)
	Primary Metal	(1.33)	Chemicals	(2.16)	Other Mining	(3.71)
	Chemicals	(1.15)	Rubber	(1.61)	Utility Srvc.	(2.01)
1975	Other Mining	(3.36)	Other Farm	(2.62)	Chemicals	(37.59)
	Petroleum	(1.38)	Grain	(2.58)	Primary Metal	(6.54)
	Rubber	(1.22)	Chemicals	(2.01)	Service	(3.97)
	Chemicals	(1.07)	Rubber	(1.44)	Other Mining	(3.77)
	Grain	(0.84)	Primary Metal	(1.07)	Utility Srvc.	(1.87)
1974	Other Mining	(7.47)	Grain	(2.91)	Chemicals	(36.29)
	Petroleum	(1.44)	Other Farm	(2.88)	Primary Metal	(7.10)
	Chemicals	(1.24)	Chemicals	(2.17)	Other Mining	(6.22)
	Rubber	(1.21)	Primary Metal	(1.66)	Petroleum	(4.95)
	Primary Metal	(1.13)	Petroleum	(1.47)	Service	(3.86)

Chapter 2

Background Studies

Economists have long been aware that transportation facilities such as highways, expressways, waterways, and railways contribute to regional growth by influencing industrial and trade structures. Recently, interest in transportation planning has focused on developing an accurate, workable model for evaluating the economic impact of transportation facilities on the surrounding regional economics. A number of interesting models were introduced to measure the economic effect of transportation facilities. The transportation facilities were assumed to lower the transportation costs, and several models identified the relationship between cost of transportation and regional development. One of the models that has successfully related transportation cost to regional development is Harris's multiregional, multi-industry forecasting (MRMI) model. (Harris (1973, 1974)

The Harris model is a regional econometric model which covers 216 sectors.[1] The structural equations of the model were fitted by the county data for the period from 1965 to 1966. Changes in regional output were explained by input prices and the agglomeration variables that firms faced in the location. The input prices include marginal transportation costs, wage rates, land prices, and cost of capital. The agglomeration variables include all other key non-price variables that affect the industrial location. An example of such a variable is congestion.

The output variables determine other regionally important variables such as employment, population, earnings, personal income, personal consumption, government expenditures, investment, and foreign exports.

The marginal transportation cost, which is computed by the transportation cost linear programming algorithms, plays a key role in determining industrial location and influences regional economic activity. Improving a transportation facility lowers the marginal transportation cost which, in turn, stimulates regional output and other regional economic activity. The MRMI model forecasts regionally important economic variables from 1979 to 1985 for each county within each standard metropolitan statistical area (SMSA). The regional forecasts from MRMI model were adjusted to conform with Almon's national forecasts (Almon (1974)). Determining supply and demand simultaneously is considered the strong point of this model. Another interesting feature of the MRMI model is that transportation cost is included in the output share equation. But like many other regional econometric models, a paucity of regional data forces the model builder to select the explanatory variables on empirical rather than theoretical grounds. The estimated coefficients may vary from one sample to another. On-going economic forecasting and impact analyses require stable estimated coef-

[1] 99 industrial, 28 construction, 8 governmental, 69 equipment purchasing, 6 population, 2 extra imports and 4 extra sections.

ficients; the lack of such stability necessitates re-estimation of the coefficients each year. Another weakness of the model is that it fails to consider the maximizing behavior of firm. According to a well-developed theory, a firm mixes its variable input costs to maximize profit. Transportation cost is simply one of many input costs, along with the purchase price of intermediate input, wages, land cost, and the service price of capital. The MRMI fails to incorporate all these input costs into the model calibrated, since many estimates were statistically insignificant. Currently, Harris is expanding the data base to improve his empirical results.

Another popular approach to relating trade flows to regional development are multiregional input-output (MRIO) models developed by Isard (1951), Moses (1955), Leontief-Strout (1963), and Polenske (1970). The MRIO models utilize three sets of basic data: regional technical coefficients, trade coefficients, and regional final demand. Under the assumption of fixed technical coefficients and fixed trade coefficients,[1] the models predict industrial output, income, employment, trade flow, and interindustry transactions. Regional final demand enters the models as an exogenous variable. Regional growth is usually identified by a change in the final demand component. Output, income, and employment multipliers are popular tools to identify this change. These multipliers are the chain reaction of a one-dollar change in final demand in one region on the industrial output, income, and employment in all regions. Occasionally, a model is simulated by changing a set of technical coefficients or a set of trade coefficients. New technology or energy conservation measures justify a change in technical coefficients. A decrease in transportation cost due to a better transportation facility justifies a change in both the technical coefficients and the trade coefficients. The simulation method is often used to

[1] Leontief-Strout (1963) specifies that the trade coefficients are endogenously determined.

determine the regional economic impact of new technology, energy conservation methods, or highway construction.

The MRIO model is one of the most promising tools currently used to forecast regional growth and interregional trade structure. However, the most serious drawback of this approach is its assumption of fixed technical coefficients and fixed trade coefficients.

Amano-Fujita (1970) modified the multiregional input-output model so that transportation cost explicitly entered the model. Following Moses' multiregional input-output model (1955), the regional input-output coefficient is assumed to be the product of the trade coefficient and the regional technical coefficient. This model specifies that regional technical coefficients and trade coefficients depend on transportation cost. Improving a transportation facility in a region lowers the transportation cost which in turn increases the trade coefficient and decreases the transportation purchase coefficient. The transportation purchase coefficient denotes the input coefficient of transportation service by industry (the row coefficients of the transportation sector or a a^{r}_{Tj} j=1,...n; r=1,...m, T=transportation service sector). An increase in the trade coefficient and a decrease in the transportation purchase coefficient create a chain impact which affects both the regional and the national economy. The economic impact of improving transportation facilities can be measured by tracing these two changes.

The Amano-Fujita econometric model suggests an interesting way to introduce transportation cost into the multiregional input-output model. However, it assumes that only one row of technical coefficients--the transportation purchase coefficients--depend on the cost of transportation and that all other technical coefficients remain unchanged. Any change in a transportation purchase coefficient is completely absorbed by a value-added coefficient. The

model also assumes that only trade coefficients between regions where transportation costs were changed are affected by the cost change. All other trade coefficients are assumed to remain unchanged. The model also implicitly assumes that both trade coefficients and technical coefficients are independent of any change in labor cost, land price, capital cost, purchase price of input, or sales price of output. The major drawback of this approach is its inability to incorporate input costs other than transportation cost into the trade and technical coefficients. The model is not capable of responding to the input-substitution behavior of firms in response to input cost change nor is it capable of tracing the import-substitution behavior of the firms in response to regional price differentials.

The third popular approach to relate the transportation costs and regional development is the spatial equilibrium analysis developed by Tinbergen (1957), Bos-Koyck (1962), and Liew-Shim (1978).

Spatial equilibrium analysis divides an economy into several geographically identifiable regions. Each region trades commodities with other regions. Usual market demand and supply schedules represent the buying and selling behavior of each region. The spatial equilibrium model hypothesizes that improving transportation facilities lowers transportation costs which in turn stimulates interregional trade. The economic impact analysis based on the spatial equilibrium model is a theoretically well-founded and empirically promising approach. The major weakness of this approach is its assumption that demand and supply equations are linear. Furthermore, in many cases, it is difficult to make a reliable estimate of demand and supply equations for each commodity in each region.

Recently, Liew-Liew (1980) has introduced a multiregional variable input-output (MRVIO) model which analyze the development impact of transportation costs.

The basic hypothesis of the MRVIO model is that a firm purchases inputs from all regions to minimize cost and sells products to all regions to maximize profit. The technical and trade coefficients are the result of this optimizing behavior. Therefore, any change in input cost or sales price should change all technical and trade coefficients. Transportation cost is one of the input costs; any change in this cost should affect all technical and trade coefficients.

The purchase price of input, sales price of output, and technical change as determinants of technical coefficients was suggested by Walras in the late ninteenth century (1954). Recently, Liew (1980), Hudson and Jorgenson (1974, 1976) introduced prices into the computation of variations in technical coefficients. The Hudson-Jorgenson model determines both macro and interindustry variables at the national level.

In this study, Liew's single-region variable input-output model was revised and extended to construct the MRVIO model. An additive and homogenous production frontier is the starting point of the Liew model. The Hudson-Jorgenson model begins with a translog price frontier. Profit-maximizing conditions permit the derivation of an additive and homogenous price frontier for each product. The simultaneous solution of all these price frontiers yields the profit-maximizing price level.

The price frontiers employed in the MRVIO model were explained by the transportation cost, wage rate, land cost, capital cost, and effective tax rate. Another difference between the two models is that in the Hudson-Jorgenson model the technical coefficients were derived from the share equations and no specification was provided to determine either trade coefficients or regional input coefficients. Their model is a single region input-output model. The MRVIO is a multiregion model which determines both regional input-output coefficients and trade coefficients. In the MRVIO model, these two coefficients

were derived from the input-output transformations.

The MRVIO model is consistent with the neoclassical theory of firm. The model assumes neither fixed technical coefficients nor fixed trade coefficients. These coefficients are endogenous variables in the model and are determined by intermediate purchase price, transportation cost, tax rate, wage rate, land cost, capital cost, and input elasticity.

The set of price frontier equations is derived from the dual relationship between production and price-possibility frontiers. The equilibrium price of each industrial output in each region was determined by simultaneously solving the price equations. The equilibrium price enters the input-output transformation function as an explanatory variable. Technical coefficients and trade coefficients are obtained from the input-output transformation relationship. Wage rate, land price, capital cost, transportation cost, and local tax rate affect the equilibrium price which, in turn, determines the technical and trade coefficients.

Chapter 3

The Multiregional Variable Input-Output Model

Consider an economy which has m regions and n commodities. Each industrial output in each region is produced by a Cobb-Douglas production frontier with a constant return to scale:

$$\ln x_j^r - \alpha_{oj}^r - \sum_{s=1}^{m} \sum_{i=1}^{n} \alpha_{ij}^{sr} \ln x_{ij}^{sr} - \gamma_j^r \ln L_j^r - \delta_j^r \ln K_j^r = 0 \qquad (3\text{-}1)$$

$$(j=1, \ldots n;\ r=1, \ldots m)$$

where

x_j^r = output of industry j located in region r;

x_{ij}^{sr} = intermediate purchase of the ith industrial product from region s by industry j located in region r;

L_j^r = labor service employed by industry j located in region r;

K_j^r = service of capital employed by industry j located in region r.

α_{oj}^r, α_{ij}^{sr}, γ_j^r and δ_j^r are parameters of the Cobb-Douglas production frontiers. The linear homogeneity is assumed to be:

$$\sum_{s=1}^{m} \sum_{i=1}^{n} \alpha_{ij}^{sr} + \gamma_j^r + \delta_j^r = 1 \qquad (3\text{-}2)$$

$$(j=1, \ldots n;\ r=1, \ldots m)$$

The supply of output is demanded by industries and final users. The usual balance equations show the market clearing relations; i.e.,

$$\sum_{rj} \sum X_{ij}^{sr} + \sum_{r} F_i^{sr} = X_i^s \qquad (3\text{-}3)$$

F_i^{sr} is the amount of final demand i produced in region s and delivered to region r. The final demand denotes the commodity delivered to the final users.

The industries in each region are assumed to maximize their profits with the technological constraints (3-1) and the balancing constraints (3-3). The problem is formulated as the usual equality constrained maximization problem.

$$\text{MAX } \pi = \sum_r \sum_j ((1-t_j^r)\, p_j^{*r}\, x_j^r - \sum_s \sum_i p_{ij}^{sr}\, x_{ij}^{sr} - w_j^r\, L_j^r - v_j^r\, K_j^r) \tag{3-4}$$

Subject to production frontiers (3-1)

and balance equation (3-3)

p_j^{*r}, w_j^r and v_j^r denote respectively the producer price, wage rate and the service price of capital of industry j located in region r. t_j^r is an effective tax rate for industry j located in tegion r. p_{ij}^{sr} is the purchase price of input i produced in region s and purchased by industry j located in region r.

The Lagrangian solutions yield to the following necessary conditions:[1]

$$\frac{\partial F}{\partial x_j^r} = (1-t^r{}_j)\, p_j^{*r} + \phi_j^r \frac{1}{x_j^r} + \lambda_j^r = 0 \tag{3-5}$$

$$\frac{\partial F}{\partial x_{ij}^{sr}} = - p_{ij}^{sr} - \phi_j^r \frac{\alpha_{ij}^{sr}}{x_{ij}^{sr}} - \lambda_i^s = 0 \tag{3-6}$$

$$\frac{\partial F}{\partial L_j^r} = - w_j^r - \phi_j^r \frac{\gamma_j^r}{L_j^r} = 0 \tag{3-7}$$

$$\frac{\partial F}{\partial K_j^r} = - v_j^r - \phi_j^r \frac{\delta_j^r}{K_j^r} = 0 \tag{3-8}$$

---

[1]The Lagrangian Equation

$$F = \sum_r \sum_j ((1-t_j^r)\, p_j^{*r}\, x_j^r - \sum \sum p^{sr}\, x_{ij}^{sr} - w_j^r\, L_j^r - v_j^r\, K_j^r)$$
$$+ \sum_r \sum_j \phi_j^r\, (\ln x_j^r - \alpha_{oj}^r - \sum_s \sum_i \alpha_{ij}^{sr} \ln x_{ij}^{sr} - \gamma_j^r \ln L_j^r - \delta_j^r \ln K_j^r)$$
$$+ \sum_s \sum_i \lambda_i^s\, (x_i^s - \sum_r \sum_j x_{ij}^{sr} - \sum_r F_i^{sr})$$

$$\frac{\partial F}{\partial \phi_j^r} = \ln x_j^r - \alpha_{oj}^r - \sum_s \sum_i \alpha_{ij}^{sr} \ln x_{ij}^{sr} - \gamma_j^r \ln L_j^r - \delta_j^r \ln K_j^r = 0 \qquad (3\text{-}9)$$

$$\frac{\partial F}{\partial \lambda_i^s} = x_i^s - \sum_r \sum_j x_{ij}^{sr} - \sum_r F_i^{sr} = 0 \qquad (3\text{-}10)$$

ϕ_j^r and λ_j^r are the Lagrangian multipliers of the jth production frontier and the ith balancing equation in region r and region s respectively.

Equations (3-5) yield the following solutions;

$$\phi_j^r = -(1-t_j^r)\, p_j^r\, x_j^r \qquad (3\text{-}11)$$

where

$$p_j^r = p_j^{*r} + \frac{\lambda_j^r}{(1-t_j)}$$

p_j^{*r} is an exogenously determined producer price of the commodity j in region r. There is no guarantee that this price could clear the market. The Lagrangian multipliers (λ_j^r) is the additional price which ensures the market clearing condition. p_j^r is the equilibrium price of the commodity j in region r. This price could balance the demand and supply of the commodity j produced in region r. Since λ_j^r is unknown, the equilibrium price is unknown and is to be solved from the model. The input purchase price of p_{ij}^{sr} is determined by (3-11a). As in the case of producer price (p_j^{*r}), there is no guarantee that these input purchase prices will clear the markets. The shadow price λ_i^s is the additional price which insures market clearing conditions.

The equilibrium price (p_i^s)[1] multiplied by the transportation cost factor (c_{ij}^{sr} = 1 + percentage of transportation cost per a dollar sale) are assumed to be equal to the market clearing prices; i.e.,

[1]The equilibrium price (p_i^s) is sum of the supplier price (p_i^{*s}) and tax adjusted shadow price $\left(\frac{\lambda_i^s}{1-t_i^s}\right)$ as defined in (3-11).

$$c_{ij}^{sr} \cdot p_i^s = p_{ij}^{sr} + \lambda_i^s \qquad (3\text{-}11a)$$

The input purchase price (p_{ij}^{sr}) varies from region to region because of differing degress of the transportation cost factor (c_{ij}^{sr}). Linehaul, terminal, and time cost constitute the transportation cost. Interest income lost during the shipping period was considered as a proxy to the time cost.

Equations ((3-6), 3-7), (3-8), (3-11), (3-11a)) provide the profit maximizing intermediate inputs (x_{ij}^{sr}), labor input (L_j^r), and capital service (K_j^r) in terms of the equilibrium prices (p_j^r);

$$x_{ij}^{sr} = \alpha_{ij}^{sr} (1-t_j^r)\ p_j^r\ x_j^r/(c_i^{sr} p_i^s) \qquad (3\text{-}12)^1$$

$$L_j^r = \gamma_j^r (1-t_j^r)\ p_j^r\ x_j^r/w_j^r \qquad (3\text{-}13)$$

$$K_j^r = \delta_j^r (1-t_j^r)\ p_j^r\ x_j^r/v_j^r \qquad (3\text{-}14)$$

By replacing the right hand side of the expression in equations (3-12) to (3-14) with the Cobb-Douglas production frontier (3-1), the following relationship was obtained:

$$\ln x_j^r - \alpha_{oj}^r - \Sigma\Sigma\ \alpha_{ij}^{sr} \ln(\alpha_{ij}^{sr}(1-t_j^r)\ p_j^r\ x_j^r/(c_i^{sr} p_i^s))$$
$$- \gamma_j^r \ln(\gamma_j^r(1-t_j^r)\ p_j^r x_j^r/w_j^r) - \delta_j^r \ln(\delta_j^r(1-t_j^r) p_j^r\ x_j^r/v_j^r) = 0$$

or

---

[1] $c_i^{sr} = c_{ij}^{sr}$ (see equation 3-19)

$$\ln x_j^r - \alpha_{oj}^r - \Sigma\Sigma\ \alpha_{ij}^{sr} \ln\alpha_{ij}^{sr} - \Sigma\Sigma\ \alpha_{ij}^{sr} \ln(1-t_j^r) - \Sigma\Sigma\ \alpha_{ij}^{sr} \ln p_j^r$$

$$- \Sigma\Sigma\ \alpha_{ij}^{sr} \ln x_j^r + \Sigma\Sigma\ \alpha_{ij}^{sr} \ln c_i^{sr} + \Sigma\Sigma\ \alpha_{ij}^{sr} \ln p_i^s$$

$$- \gamma_j^r \ln\gamma_j^r - \gamma_j^r \ln(1-t_j^r) - \gamma_j^r \ln p_j^r - \gamma_j^r \ln x_j^r + \gamma_j^r \ln w_j^r$$

$$- \delta_j^r \ln\delta_j^r - \delta_j^r \ln(1-t_j^r) - \delta_j^r \ln p_j^r - \delta_j^r \ln x_j^r + \delta_j^r \ln v_j^r = 0 \quad (3\text{-}15)^1$$

Using the homogeniety assumptions (i.e., $\Sigma\Sigma\ \alpha_{ij}^{sr} + \gamma_j^r + \delta_j^r = 1$), $\ln x_j^r$ vanishes in the equation (3-15), the multiregional price frontier equation was obtained:

$$\ln p_j^r = -\alpha_{oj}^r - \Sigma\Sigma\ \alpha_{ij}^{sr} \ln\alpha_{ij}^{sr} - \gamma_j^r \ln\gamma_j^r - \delta_j^r \ln\delta_j^r - \ln(1-t_j^r)$$

$$+ \Sigma\Sigma\ \alpha_{ij}^{sr} \ln c_i^{sr} + \Sigma\Sigma\ \alpha_{ij}^{sr} \ln p_i^s + \gamma_j^r \ln w_j^r + \delta_j^r \ln v_j^r = 0$$

$$(j=1, \ldots n;\ r=1, \ldots m) \qquad (3\text{-}16)$$

The price frontier equation (3-16) can be conveniently presented as a matrix :

$$(I - S) \ln p = h \qquad (3\text{-}17)$$

where $\underset{(nm,nm)}{S} = \begin{bmatrix} \alpha^{11} & \cdots & \alpha^{m1} \\ \vdots & & \vdots \\ \alpha^{1m} & \cdots & \alpha^{mm} \end{bmatrix}$ $\underset{(nm,1)}{\ln p} = \begin{bmatrix} \ln p^1 \\ \vdots \\ \ln p^m \end{bmatrix}$ $\underset{(nm,1)}{h} = \begin{bmatrix} h^1 \\ \vdots \\ h^m \end{bmatrix}$

---

[1] Unless stated otherwise, $\Sigma\Sigma$ $\sum_{s=1}^{m} \sum_{i=1}^{n}$

and

$$\underset{(n,n)}{\alpha^{sr}} = \begin{bmatrix} \alpha_{11}^{sr} & \cdots & \alpha_{n1}^{sr} \\ \vdots & & \vdots \\ \alpha_{1n}^{sr} & \cdots & \alpha_{nn}^{sr} \end{bmatrix} \qquad \underset{(n,1)}{\ln p^{r}} = \begin{bmatrix} \ln p_1^r \\ \vdots \\ \ln p_n^r \end{bmatrix} \qquad \underset{(n,1)}{h^{r}} = \begin{bmatrix} h_1^r \\ \vdots \\ h_n^r \end{bmatrix}$$

I is an (n·m) by (n·m) identity matrix.

h_j^r is the sum of all variables except the price variable; i.e.,

$$h_j^r = -\left(\Sigma\Sigma\ \alpha_{ij}^{sr} \ln\alpha_{ij}^{sr} + \gamma_j^r \ln\gamma_j^r + \delta_j^r \ln\delta_j^r\right) - \alpha_{oj}^r$$

$$+\ \Sigma\Sigma\ \alpha_{ij}^{sr} \ln c_i^{sr} - \ln(1-t_j^r)$$

$$+\ \gamma_j^r \ln w_j^r + \delta_j^r \ln v_j^r \qquad (3\text{-}18)$$

In the price frontier equation, it was implicitly assumed that the transportation cost of delivering commodity i from region s to region r is the same regardless of the type of buyer; i.e.,

$$c_i^{sr} = c_{ij}^{sr} \qquad (3\text{-}19)$$

A region does not constitute a single point in a geographical area. Therefore, shipments of commodities within a region also require a transportation cost. This is called "intra regional transportation cost" and takes the form c_i^{sr} when s=r reflects the intra regional transportation cost. The Arkansas waterway system not only reduces the transportation cost of delivering a commodity from the waterway counties to the rest of the U.S., but also reduces the shipping cost of carrying a commodity within the waterway counties. In contrast to the intra regional transportation cost, the shipping cost charged to delivering a commodity between two regions is called "inter regional transportation cost"

or, c_i^{sr} when $s \neq r$ reflects the inter regional transporation cost.

A price frontier is expressed in terms of the transportation cost, (c_i^{sr}), effective tax rate (t_j^r), local wage rate (w_j^r), service price of capital (v_j^r), input elasticity $(\alpha_{ij}^{sr}, \gamma_j^r, \delta_j^r)$, and technical progress parameter (α_{oj}^r).

In general, the profit-maximizing price level has a positive relationship with the transportation cost, effective tax rate, wage rate, service price of capital and a negative relationship with the technical progress parameter.

By simultaneously solving the price froniters (3-17), the nm profit-maximizing price level was obtained in terms of the transportation cost, effective tax rate, local wage rate, service price of capital, input elasticity, and the technical progress parameter; i.e.,

$$p_j^r = p_j^r (c_i^{sr}, t_j^r, w_j^r, v_j^r, \alpha_{ij}^{sr}, \gamma_j^r, \delta_j^r, \alpha_{oj}^r) \tag{3-20}$$

This is the equilibrium prices which equate the balancing equation.

The input demand equations (3-12) provide the multiregional input-output coefficients. These coefficients are expressed in terms of the equilibrium prices, effective tax rates, and the transportation cost; i.e.,

$$a_{ij}^{sr} \equiv \frac{x_{ij}^{sr}}{x_j^r} = \alpha_{ij}^{sr}(1-t_j^r) \frac{p_j^r}{c_i^{sr}\, p_i^s} \tag{3-21}$$

From equations (3-20) and (3-21), it is evident that the regional input-output coefficients depend on transportation cost, tax rate, wage rate, service price of capital, input elasticity, and technical progress parameters;

$$a_{ij}^{sr} = a_{ij}^{sr} (c_i^{sr}, t_j^r, w_j^r, v_j^r, \alpha_{ij}^{sr}, \gamma_j^r, \delta_j^r, \alpha_{oj}^r) \tag{3-22}$$

Regional technical coefficient is the sum of the regional input-output coefficient over the region; i.e.,

$$a_{ij}^{r} = \sum_{s=1}^{m} a_{ij}^{sr} \qquad (3\text{-}23)$$

$$(i,j=1, \ldots n;\ r=1, \ldots m)$$

Moses [1955] calculates the regional input-output coefficient by multiplying the trade coefficient (t_{ij}^{sr}) by the regional technical coefficient; i.e.,

$$a_{ij}^{sr} = t_{ij}^{sr} \cdot a_{ij}^{r} \qquad (3\text{-}24)^{1}$$

$$(i, j=1, \ldots n;\ s,r=1, \ldots m)$$

From equations (3-24), the following relationship is evident:

$$t_{ij}^{sr} = a_{ij}^{sr}/a_{ij}^{r} \qquad (3\text{-}25)$$

$$(i, j-1, \ldots n;\ s,r=1, \ldots m)$$

The variable trade coefficient, which is expressed in terms of transportation cost, primary input price, tax rate and input parameter, was obtained from equations (3-22), (3-23), and (3-25); i.e.,

$$t_{ij}^{sr} = t_{ij}^{sr}\ (c_i^{sr},\ t_j^{r},\ w_j^{r},\ v_j^{r},\ \alpha_{ij}^{sr},\ \gamma_j^{r},\ \delta_j^{r},\ \alpha_{oj}^{r}) \qquad (3\text{-}26)$$

The average trade coefficient is estimated as:

$$t_i^{sr} = \frac{1}{n} \sum_{j=1}^{n} t_{ij}^{sr} \qquad (3\text{-}27)$$

Following Moses' specifications, it was assumed that each industry within region r consumes the same fraction of the import of commodity i from region s so that the trade coefficient (t_{ij}^{sr}) is the same regardless of the final user; i.e.,

$$t_{ij}^{sr} = t_i^{sr} \qquad (3\text{-}28)$$

---

[1] Moses [1955] assumes that $t_{ij}^{sr} = t_i^{sr}$

The average trade coefficient (t_i^{sr}) in equation (3-27) is derived from Moses' specifications. In the MVRIO model it is derived from the dual relationship between the production frontier and the price frontier.

Similarly, the labor coefficient (L_j^r/x_j^r) and the capital coefficient (K_j^r/x_j^r) are obtained.

$$L_j^r/x_j^r = \gamma_j^r \ (1-t_j^r)p_j^r/w_j^r \tag{3-29}$$

$$K_j^r/x_j^r = \delta_j^r \ (1-t_j^r)p_j^r/v_j^r \tag{3-30}$$

So far, the system solved equilibrium prices ($p_j^r = p_j^{*r} + \lambda_j^r/(1-t_j^r)$), regional input-output coefficients ($a_{ij}^{sr} = x_{ij}^{sr}/x_j^r$), trade coefficients ($t_i^{sr}$), labor coefficients ($L_j^r/x_j^r$), and capital coefficients (K_j^r/x_j^r).

Regional output (x_j^r) is determined by the balance equations (3-3) with given final demand shipped (F_i^{sr}).[1] F_i^{sr} denotes amounts of the commodity i produced in region s and shipped to the final demand account in region r.

Another important concept on final demand is the final demand received (y_i^r). y_i^r denotes the amount of the commodity i received by region r in its final demand account.

The final demand shipped (F_i^{sr}) and the final demand received have the following relations.

$$F_i^{sr} = t_i^{sr} \ y_i^r \tag{3-31}$$

The balance equations (3-3) and the equation (3-31) are combined and are expressed as a matrix form;

$$x = (I - TA)^{-1} \ Ty \tag{3-32}$$

[1] Moses [1955] defines as the "final demand shipment."

where

$$x_{(nm,1)} = \begin{bmatrix} x^1 \\ \vdots \\ x^m \end{bmatrix} \quad T_{(nm,nm)} = \begin{bmatrix} T^{11} & \cdots & T^{1m} \\ \vdots & & \vdots \\ T^{m1} & \cdots & T^{mm} \end{bmatrix} \quad A_{(nm,nm)} = \begin{bmatrix} A^1 & & 0 \\ & A^2 & \\ & & \ddots \\ 0 & & A^m \end{bmatrix} \quad y_{(nm,1)} = \begin{bmatrix} y^1 \\ \vdots \\ y^m \end{bmatrix}$$

$$x^r_{(n,1)} = \begin{bmatrix} x^r_1 \\ \vdots \\ x^r_n \end{bmatrix} \quad T^{sr}_{(n,n)} = \begin{bmatrix} T^{sr}_1 & & 0 \\ & \ddots & \\ 0 & & t^{sr}_n \end{bmatrix} \quad A^r_{(n,n)} = \begin{bmatrix} a^r_{11} & \cdots & a^r_{1n} \\ \vdots & & \vdots \\ a^r_{n1} & \cdots & a^r_{nn} \end{bmatrix} \quad y^r_{(n,1)} = \begin{bmatrix} y^r_1 \\ \vdots \\ y^r_n \end{bmatrix}$$

x and y are n·m component vectors of regional output and regional final demand, respectively. T and A are n·m by n·m matrices of the trade coefficient and the regional coefficient.

This balance equation solves the industrial output (x^r_j) which identifies all profit maximizing input demands (x^{sr}_{ij}), labor input (L^r_j), and the service price of capital (K^r_j).

Chapter 4

Transportation Cost Simulation Models

The multiregional variable input-output model responds to an industry's effort to minimize input costs. Transportation cost is one of many input costs; i.e., wage rate, capital cost, and land cost, which a firm faces in a local economy. A change in any one of the input costs in one region results in changes in equilibrium output, prices, regional technical coefficients, trade coefficients, and various multipliers in every region. Table 4-1 lists the input-output parameters and variables of the MRVIO model. The exogenous variables were determined before they were entered into the model. The input parameters are assumed to remain unchanged. The endogenous variables are the dependent variables of the model.

This chapter describes step by step how a change in one of the exogenous variables affects the endogenous variables of the model. The impact of such a change affects equilibrium prices in every region. To understand the relationship between exogenous variables and price level, the price frontier equation is rewritten as follows:

$$\ln p_j^r = g_j^r + \Sigma\Sigma\, a_{ij}^{sr} \ln c_i^{sr} + \gamma_j^r \ln w_j^r + \delta_j^r \ln v_j^r - \ln(1-t_j^r) + \Sigma\Sigma\, a_{ij}^{sr} p_i^s \qquad (4\text{-}1)^1$$

where

$$g_j^r = -\alpha_{oj}^r - \Sigma\Sigma\, a_{ij}^{sr} \ln a_{ij}^{sr} - \gamma_j^r \ln \gamma_j^r - \delta_j^r \ln \delta_j^r \qquad (j=1, \ldots n;\ r=1, \ldots m)$$

[1] Unless stated otherwise, $\Sigma\Sigma$ denotes $\sum_{s=1}^{m} \sum_{i=1}^{n}$.

TABLE 4.1

Input-Output Parameters and Variables
in MRVIO Model and Those in Other Models

Models	Input Parameter	Exogenous Variable	Endogenous Variable
MRVIO	• Input elasticities • Technical progress parameters	• Wage rates • Service price of capital which includes land costs and capital costs • Transportation costs • Effective tax rates • Final demand	• Industrial output, income, and employment • Industrial prices • Regional technical coefficients and regional interindustry transactions • Trade coefficients and interregional trade flow matrices • Price, wage multipliers • Output, income, employment multipliers
Others	• Regional technical coefficients • Trade coefficients	• Final demand • Effective tax rates	• Industrial output, income and employment • Regional interindustry transactions • Inter-regional trade flow • Output, income, employment multipliers

The price frontier equation can be presented as a matrix:

$$(I - S)\ \ln p = g + W \cdot \ln c + \hat{\gamma}\ \ln w + \hat{\delta}\ \ln v - \ln(1-t) \qquad (4\text{-}2)$$

where

$$\underset{(nm,1)}{g} = \begin{bmatrix} g_1^1 \\ \vdots \\ g_n^1 \\ \vdots \\ g_n^m \end{bmatrix} \quad \underset{(nm,nmm)}{W} = \begin{bmatrix} S^1 & & & 0 \\ & S^2 & & \\ & & \ddots & \\ 0 & & & S^m \end{bmatrix} \quad \underset{(n,nm)}{S^r} = \begin{bmatrix} \alpha_{11}^{1r} \cdots \alpha_{n1}^{1r}, \cdots \alpha_{11}^{mr} \cdots \alpha_{n1}^{mr} \\ \vdots \\ \alpha_{1n}^{1r} \cdots \alpha_{nn}^{1r}, \cdots \alpha_{1n}^{mr} \cdots \alpha_{nn}^{mr} \end{bmatrix}$$

$\underset{(mn,mn)}{\hat{\gamma}}$ = diagonal matrix of γ_j^r;

$\underset{(mn,mn)}{\hat{\delta}}$ = diagonal matrix of δ_j^r;

$\ln w$ = m·n component vector of $\ln w_j^r$;

$\ln v$ = m·n component vector of $\ln v_j^r$;

$\ln(1-t)$ = m·n component vector of $\ln(1-t_j^r)$.

$$\underset{(nmm,1)}{\ln C} = \begin{bmatrix} \ln C_1^{11} \\ \vdots \\ \ln C_n^{11} \\ \vdots \\ \ln C_1^{mm} \\ \vdots \\ \ln C_n^{mm} \end{bmatrix}$$

(The figure inside the parenthesis is the size of the matrix.)

The relationship between a change in a cost variable and its impact on equilibrium price can be shown by taking the derivative of the price frontier vector function (4-2) with respect to each cost vector:

$$\frac{\partial \ln p}{\partial \ln c} = ((I-S)^{-1} W)' \qquad (4\text{-}3)$$

$$\frac{\partial \ln p}{\partial \ln w} = ((I-S)^{-1} \hat{\gamma})' \qquad (4\text{-}4)$$

$$\frac{\partial \ln p}{\partial \ln v} = ((I-S)^{-1} \hat{\delta})' \qquad (4\text{-}5)$$

$$\frac{\partial \ln p}{\partial \ln(1-t)} = -((I-S)^{-1})' \qquad (4\text{-}6)$$

The prime (′) denotes the transpose.

$((I-S)^{-1}W)'$ is an (n·m·m) by (n·m) transportation cost-related price multiplier. It explains a corresponding change in equilibrium price in each industry in each region resulting from a 1 percent change in c_j^{sr}. The transportation cost-related price multiplier explains in detail the impact of a transportation cost change on industrial prices in all regions.

A change in transportation cost for a single commodity between two regions could affect the equilibrium price of all commodities in every region. An identical rate increase in transportation cost for two different commodities results in a different impact on price in each region. From a policy point of view, these two statements are very important. They imply that the construction of a waterway in Oklahoma and Arkansas could affect the price of bread in New York. An increase in motor fuel cost may have a varying price impact based on the weight, bulk, and value of commodities shipped by vehicles using the fuel. The transportation cost-related price multipliers provide interesting details of the effect of a change in transportation cost.

The price multipliers (right hand expressions) of equations (4-4), (4-5), and (4-6) relate to wages, service price of capital, and tax rates. Because all regional economies are interrelated, a change in one of these prices or tax rates in one region affects industrial prices in all regions. This chain reaction can be traced by the price multipliers.

The new price structure resulting from a change in transportation cost or a change in a primary input price, such as the wage rate or the service price of capital, affects the multiregional input-output coefficients. These coefficients are decomposed into regional technical coefficients and trade coefficients.

From equation (3-21) in chapter 3, the following relationship is evident:

$$\ln a_{ij}^{sr} = \ln \alpha_{ij}^{sr} + \ln(1-t_j^r) - \ln c_i^{sr} - \ln p_i^s + \ln p_j^r \qquad (4-7)$$

If only transportation cost is changed in an economy, the rate of change in the multiregional input-output coefficient can be easily identified as follows:

$$\frac{\partial \ln a_{ij}^{sr}}{\partial \ln c_i^{sr}} = \frac{\partial \ln p_j^r}{\partial \ln c_i^{sr}} - 1 - \frac{\partial \ln p_i^s}{\partial \ln c_i^{sr}} \tag{4-8}$$

or $$\partial \ln a_{ij}^{sr} = \partial \ln p_j^r - \partial \ln c_i^{sr} - \partial \ln p_i^s \tag{4-9}$$

The right hand expressions of equation (4-8) is simply the transportation cost-related price multiplier obtained in equation (4-3).

Assume a base year multiregional input-output coefficient: $(a_{ij}^{sr}(t_o))$. A new input-output coefficient resulting from a change in transportation cost $(a_{ij}^{sr}(t_1))$ can be evaluated:

$$a_{ij}^{sr}(t_1) = a_{ij}^{sr}(t_o) \text{ EXP } (\partial \ln p_j^r - \partial \ln c_i^{sr} - \partial \ln p_i^s) \tag{4-10}$$

(Note: $\partial \ln a_{ij}^{sr}$ is approximated by $\ln a_{ij}^{sr}(t_1) - \ln a_{ij}^{sr}(t_o)$ or $\ln(a_{ij}^{sr}(t_1)/a_{ij}^{sr}(t_o))$.

Similarly, a change in wage rate, service price of capital, and effective tax rate is traced as follows:

$$\frac{\partial \ln a_{ij}^{sr}}{\partial \ln w_j^r} = \frac{\partial \ln p_j^r}{\partial \ln w_j^r} - \frac{\partial \ln p_i^s}{\partial \ln w_j^r} \tag{4-11}$$

$$\frac{\partial \ln a_{ij}^{sr}}{\partial \ln v_j^r} = \frac{\partial \ln p_j^r}{\partial \ln v_j^r} - \frac{\partial \ln p_i^s}{\partial \ln v_j^r} \tag{4-12}$$

$$\frac{\partial \ln a_{ij}^{sr}}{\partial \ln(1-t_j^r)} = \frac{\partial \ln p_j^r}{\partial \ln(1-t_j^r)} - \frac{\partial \ln p_i^s}{\partial \ln(1-t_j^r)} \tag{4-13}$$

The multiregional input-output coefficient (a_{ij}^{sr}) is disaggregated into the regional technical coefficient (a_{ij}^r) and the trade coefficient (t_i^{sr}). This was

shown in equations (3-23) to (3-28) in chapter 3.

A change in regional technical and trade coefficients results in a change in industrial output, income, and employment.

A one-dollar change in final demand creates a chain impact on industrial output which can be traced by the output multipliers. The multiregional variable input-output model yields the following output, income, and employment multipliers;

Definitions:

$M = (I-TA)^{-1} = \{M_{ij}^{sr}\}$: an n·m by n·m direct and indirect requirement matrix of the multiregional input-output coefficients ($a_{ij}^{sr} = t_i^{sr} \cdot a_{ij}^{r}$). The matrices T and A are defined in chapter 2;

I : an n·m by n·m identity matrix;

$K = \{K_i^r\}$: an n·m component income coefficient vector;

$E = \{e_i^r\}$: an n·m component employment coefficient vector;

Calculations:

$$\text{Output multipliers} \quad TM_j^r = \sum_{s=1}^{m} \sum_{i=1}^{n} M_{ij}^{sr} \tag{4-14}$$

$$\text{Income multipliers} \quad IM_j^r = \sum_{s=1}^{m} \sum_{i=1}^{n} M_{ij}^{sr} \cdot K_i^s/K_j^r \tag{4-15}$$

$$\text{Employment multipliers} \quad EM_j^r = \sum_{s=1}^{m} \sum_{i=1}^{n} M_{ij}^{sr} \cdot e_i^s/e_j^r \tag{4-16}$$

for r=1, ...m, j=1, ...n.

The transportation cost, wage rate, and service price of capital could affect the regional technical coefficient (a_{ij}^r) and the trade coefficient (t_i^{sr}). Therefore, they could also affect output, income, and employment multipliers.

A change in transportation cost will have an initial effect on equilibrium prices, industrial output, income, employment, trade coefficients, and regional technical coefficients. This is the short run transportation impact. The changes in these variables will cause changes in local wage rates, land costs, and tax rates. These secondary changes in cost elements will have a feedback effect which will alter equilibrium prices, industrial output, income, employment, trade coefficients, and regional technical coefficients. Combining the secondary changes with the short run impact constitutes the long run transportation impact.

The basic structure of the model is illustrated as below. The transportation cost changes both regional technical coefficients (ΔA) and the trade coefficients (ΔT). Given final demand, these changes affect the regional growth. In the multiregional study, the final demand has two meanings; one is final demand shipped (F) and the other is final demand received (y).

Which final demand should we assume to be given? When the final demand shipped (F) is given, the model is named as the demand adjusted model. Instead of estimating the final demand (F) each time, we employ the following formula which does not require the final demand to compute the industrial impact.

The balance equation is;

$$x = (I - TA)^{-1} Ty \tag{4-17}$$

The final demand shipped (F) and the final demand received (y) has this relation;

$$F = Ty \tag{4-18}$$

By combining these two equation, we have the balance equation expressed in terms of the final demand shipped.

$$x = (I - TA)^{-1} F \tag{4-19}$$

or

$$x - TAx = F \tag{4-20}$$

The transportation cost changes the balance equation as below;

$$\Delta x - \Delta(TA) \cdot x - (TA)\Delta x = \Delta F \tag{4-21}$$

Since the transportation cost is assumed to be independent of the amount of the final demand shipped, ΔF becomes zero. The equation (4-21) reduces to

$$(\Delta x)\ (\hat{x})^{-1} = (I - TA)^{-1}\ \Delta(TA) \tag{4-22}$$

$\hat{X}$ is a diagonal matrix of industrial output (x_j^r). Since transportation cost changes the trade coefficients (ΔT) and the final demand shipped (F) is assumed to be fixed, the final demand received should be adjusted so that the equation (4-18) should be held;

$$(\Delta y + y) = (\Delta T + T)^{-1} F \tag{4-23}$$

A change in T will certainly change y. Because of this reason, this simulation is called "demand adjusted model."

Alternatively, we may assume the final demand received (y) to be fixed. The equation (4-17) is rewritten as belows;

$$x - (TA)\ x = T \cdot y \tag{4-24}$$

$$\Delta x - \Delta(TA)\ x - (TA)\Delta x = \Delta T \cdot y + T \cdot \Delta y \tag{4-25}$$

Since Δy is assumed to be zero and y becomes $T^{-1}\ (I - TA)\ x$, and the equation (4-25) reduces to the following;

$$(I - TA)\ \Delta x = (\Delta(TA) + \Delta T \cdot T^{-1}\ (I - TA))\ x \tag{4-26}$$

$$\begin{aligned} \Delta x \cdot (\hat{x})^{-1} &= (I - TA)^{-1}\ (\Delta(TA) + \Delta T \cdot T^{-1} - \Delta TA) \\ &= (I - TA)^{-1}\ (\Delta TA + T\Delta A + \Delta TT^{-1} - \Delta TA) \\ &= (I - TA)^{-1}\ (T\Delta A + \Delta TT^{-1}) \end{aligned} \tag{4-27}$$

The rate of change in industrial output ($\Delta x\ (\hat{x})^{-1}$) due to the transportation cost change becomes the right hand expression of equation (4-27). Since the final demand received (y) is assumed to be independent of the transportation cost change, and transportation cost affect the trade coefficients. The final demand supplied (F) has to be changed to ensure the equation (4-18); i.e.,

$$(F + \Delta F) = (T + \Delta T)\ y \qquad (4\text{-}28)$$

Because the final demand supplied has to adjust the transportation cost impact, this simulation is called "supply adjusted model."

Chapter 5

Explanation on the Data

The multiregional variable input-output model requires extensive data gathering:

1. Estimates of output and value added for each region
2. Estimates of regional technical coefficients
3. Estimates of final demand for each region
4. Estimates of trade coefficients
5. Estimates of industrial price, wage rate and service price of capital.

Our three regional classification requires data at the county, state and national levels. Region 1 consists of 13 Oklahoma counties and 5 Arkansas counties. Region 2 requires the Oklahoma and Arkansas State data since it is the rest of Oklahoma and Arkansas. Region 3 requires the national data. Region 3 includes all other states except Oklahoma and Arkansas.

It is essential to have controls at the national, state and county levels to ensure that all data are consistent with each other.

(5.1) An Estimation of Regional Output and Value Added

The 496 order BEA input-output tape for 1972 contains value added and output data for each sector at the national level. Also, the 88 order BEA input-output tape for 1972 disaggregates the value added data into wage, nonwage and tax payments for each industry. Employment and payroll information are compiled from the Bureau of Labor Statistics, Employment and Earnings. The state and county data for employment and payrolls are available from the Department of Commerce publication entitled County Business Patterns.

The 1972 U.S. input-output tape provides the national outputs and values added by each of 496 industries. These national totals were allocated to the state level, and the state totals were allocated to the county level. These county totals were combined to yield the water and non-water statistics. In each level of allocation, the best proxy variable was employed for its computation.

The values added reported by the census does not coincide with the values added employed in the 1972 OBE I/O table. The OBE value added is available only for the national total, and the census value added is available for both the state and national level. The logical choice is to use the census data to allocate the national (OBE) value added to the state level. The census values added are not available for agriculture, government and the service industries. The values added for these industries were estimated by the Kendrick-Jaycox method. These estimated values added were then used to operate the national values added to the state level.

Similarly, the national output of each industry was allocated to the state. The market value of agricultural product sold was used for agricultural allocation and the value of production reported by the Minerals Yearbook was employed for mineral allocation. Following Polenske (1970), the value of shipment reported in the Annual Survey of Manufacturers was used to allocate the manufacturing output to the state level. The estimated value added shares of the state with respect to the U.S. was used to allocate the outputs of government and other sectors to the state level.

The state output and values added by each industry were computed from the national totals the manner described above. The state total was then allocated to the county level by using prorated variables. Followings are explanations

of the methods by which estimates were made for agriculture, mining, manufacturing, government and other sectors.

(5.1.1) Agricultural Sector

We estimate the gross farm product for Oklahoma and Arkansas for the years of 1972-1977 by the Kendrick-Jaycox method. For example, 1972 Oklahoma gross farm product was estimated as below:

Gross Farm Product of Oklahoma, 1972
(in million dollar)

	Amounts
1. Cash receipts from marketing	1,395.0
2. Value of home consumption	17.5
3. Gross rental value of dwellings	70.2
(Less: net rent to nonoperator landlords)	78.8
4. Net change in inventories	34.2
5. Value of total farm output (1+2+3+4)	1,438.1
6. Purchase of raw materials	600.7
Feed	215.3
Livestock	318.4
Seed	18.5
Fertilizer	48.5
7. Repairs and operation of equipment	118.7
8. Miscellaneous operating expenses	189.9
9. Total current expenses (6+7+8)	909.3
Gross Farm product (5-9)	528.8

These gross farm products are prorated to each farm product by the percentage of cash receipts from marketing. For example, 1972 Oklahoma gross farm product is allocated to each farm industry as below;

	% of Cash Receipt from Marketing	Farm Value Added
Dairy farm products	5.3	28.02
Poultry and eggs	2.2	11.63
Meat animals and products	69.3	366.46
Cotton	2.8	14.81
Food and feed grains	15.0	79.32
Fruits and nuts	0.2	1.06
Vegetable and melons	0.5	2.64
Oil bearing crops	3.1	16.40
Miscellaneous agricultural products	1.6	8.46
Total	100.0	528.8

The estimated values added of Oklahoma farm products and those of U.S. farm products were used to prorate the national (OBE) values added to the Oklahoma values added at the state level. Similarly, we estimate values added of Arkansas farm products.

$$\left(\begin{array}{l}\text{State value added}\\ \text{by the jth farm industry}\end{array}\right) = \left(\begin{array}{l}\text{OBE value added by the jth}\\ \text{farm industry at U.S. I-O tape}\end{array}\right) X \left(\frac{\begin{array}{l}\text{Estimated gross farm product of the jth}\\ \text{farm industry at the state level}\end{array}}{\begin{array}{l}\text{Estimated gross farm product of jth farm}\\ \text{industry in the U.S.}\end{array}}\right)$$

Agricultural outputs are estimated as follows: The U.S. agricultural output for each farm industry is available from the 1972 input-output tape. We

use the market value of agricultural product sold to allocate national agricultural outputs to state agricultural outputs for Oklahoma and Arkansas. Table (5.1) provides the list of prorated variables used for state allocation from the national total.

These state values added and outputs by each farm sector are further allocated at the county level using the production data as the blow-up variable.

TABLE 5.1

The Variables Employed to Allocate the National Total to Regional Level

	State Level		County Level	
	Value Added	Output	Value Added	Output
Agriculture	Cash Receipt by Agricultural Commodity	Market Value of Agricultural Product Sold	Production	Production
Mining	Census Value Added	Value of Production	Value of Production	Value of Production
Manufacturing	Value Added reported by the Annual Survey of Manufacturer	Value of shipments reported by the Annual Survey	Taxable Payrolls	Taxable Payrolls
Other Sectors	Estimated Value Added by Kendrick Jaycox Method	Value added by Kendrick-Jaycox Method	Taxable Payrolls	Taxable Payrolls

Because of the differences between the state and county industrial classification in the agricultural sector, a representative product was employed. Table (5.2) provides the blow-up variables for each farm industry. For example, to estimate the Oklahoma water county output for meat animals and products, we collect the number of cattle in each of Oklahoma's water county. Then, we calculate the percentage of cattle in the water counties to total number of cattle in Oklahoma

TABLE 5.2

Prorated Variables Employed to Allocate the Farm Statistics from State to County Level

Industrial Classification		Oklahoma	Arkansas
(1)	Dairy Farm	Milk Cows (96.2%)*	Milk Cows (96.9%)
(2)	Poultry and Eggs	Broilers and Eggs (77.3%)	Broilers and Eggs (88.6%)
(3)	Meat Animal and Products	All Cattle and Calves (95.1%)	All Cattle and Calves (87.0%)
(4)	Cotton	Cotton (100%)	Cotton (100%)
(5)	Food and Feed Grains	Wheat, Sorghum, Corn, Barley (93.3%)	Rice, Wheat, Sorghum (94.3%)
(6)	Oil Bearing Crops	Peanut (74.2%)	Soybean (100%)

*The figures inside the parenthesis are the percentages of cash receipts contributed by the prorated variable within each industrial classification.

as the blow-up variables and divide the Oklahoma output for meat animals and products between the water county region and the rest of Oklahoma. In Oklahoma, the percentage of cash receipts from cattle within the meat animal and product industry is approximately 95 percent. When more than one variable is available such as wheat, sorghum, corn and barley for 'food and feed grains', their combined revenues are used as the blow-up variable.

The county value added (or output) by each farm sector are aggregated into waterway counties and rest of Oklahoma and Arkansas. The value added (or output) by each farm for the rest of the U.S. are the differences between the OBE national value added (or output) and the combined value added (or output) of water region and non-water region.

(5.1.2) Mining Sectors

The Mineral Yearbook and 1972 Census of Mineral Industries provide production and revenue data at both the national and state level. They also report

county statistics of mineral industries. However, the county data is either too aggregated or incomplete because data on many counties are withheld due to the limited number of firms in these counties. Instead, we use Oklahoma Tax Commission data. The Oklahoma Tax Commission reports the value of oil production and the value of natural gas production on which gross production taxes are paid. County coal production data was compiled from reports of the Chief Mine Inspector, State of Oklahoma.

The 1972 OBE mineral output and value added are prorated by using value of production for state output and census value added for state value added. Then the state value added and output are prorated into county level value added and output by using value of production as blow-up variable.

(5.1.3) Manufacturing, Government and Others

Annual Survey of Manufacturers and 1972 Census of Manufactures provide detailed statistics on employment, wage payment, value added and value of shipment at national and state level. They also supply county statistics. However, county statistics are either too aggregated or were withheld due to confidentiality requirements. Using the value of shipments as the blow-up variable, the 1972 OBE output data is prorated into state level. These state output data are futhter disaggregated into the county levels by using the payroll from the County Business Patterns as the blow-up variable.

Using value added by Annual Survey of Manufacturers the OBE value added is prorated into state value added. State manufacturing statistics on wage and value added are disaggregated into the county level by using the payroll as the blow-up variable.

Employment at national, state and county level was obtained from the County Business Patterns.

Values added in government and other sectors were estimated at state level for Oklahoma and for Arkansas by the method suggested by Kendrick-Jaycox. The values added which we estimated may not add up to the OBE value added. To maintain consistency with the 1972 OBE values added, the OBE data are prorated into state level by using the estimated value added as a blow-up variable. The OBE outputs for government and other sectors are prorated into state outputs using the estimated values added as blow-up variable. By using the county payroll data as a blow-up, the state values added and outputs are prorated into county level once more.

(5.2) An Estimation of Regional Technical Coefficients

Regional technical coefficients were estimated from the 1972 U.S. input-output tape (496-industrial classification) by using a product mix method. It assumes that the different degress of industrial mix in each region make the regional coefficients vary from one region to another. For example, Food and Kindred products is an aggregation of forty-four 6-digit OBE industries. It includes a wide range of industries from meat packing to chewing gum plants. At the county level, the industrial composition differs from one county to another. For each county, the industrial location was identified by the 1972 County Business Patterns which reports the number of four digit SIC industries located in each county. Industries located in each county are sorted from the tape and each is identified as to whether it is located in water or non-water regions of Oklahoma and Arkansas.

When the industries were aggregated for the Food and Kindred products industry for a region, for example, only the industries (out of forty-four 6-digit OBE industries) located in the region were included for its aggregation. However, the deletion was done only columnwise on the ground that the industry

located in the region could import its inputs if those commodities were not available from the local producers.

Once this aggregation was done for a region, the percentage share of the intermediate purchase of Food and Kindred products industry with respect to existing total output (excluding value added) of all 35 sectors was computed for the region. This percentage share differs from region to region because of varying degrees of industrial mix.

Since the value added and the industrial output by each industry in each region are available, the regional intermediate total is computed for each industry by subtracting its value added from the industrial output. This intermediate total is multiplied by the percentage shares of intermediate purchases to obtain the regional interindustry flows.

The procedure is described step by step.

Step 1. Identifies the six-digit OBE industry which is located in the region.

Step 2. Delete columns of all non-existing industries from the 1972 U.S. input-output tables (only delete columns, not rows) by refering to 1972 County Business Patterns.

Step 3. Aggregate the interindustry transaction table to 35 sector table for each region and compute percentage shares of intermeidate purchases by each industry for each region.

Step 4. Compute regional total intermediate purchase by each industry by subtracting the industry's regional values added from its regional output.

Step 5. This regional total intermediate purchase by each industry is multiplied by the percentage shares of intermediate purchase by each industry and the regional interindustry flows are obtained.

Step 6. This regional interindustry flow is divided by its regional output to obtain the regional technical coefficients.

(5.3) An Estimation of Regional Final Demand

In the multiregional analysis, final demand has two meanings. One is final demand shipped (F) and the other final demand received (y). The state final demand estimated by Jack Faucett Associates (Scheppack (1972)) coincides with the final demand received. This final demand (1970 forecast) after adjusting the 1972 level was used as the basis for computing the regional final demand. Using following variables, each component of the final demand was prorated to the county level and these county final demands were added up to make a regional final demand. Following variables were employed to prorate the state final demand at county level.

Final Demand Component	Prorated Variables
Consumption	County personal income
Government spending	Local government expenditures
Investment and others	County industrial output

(5.4) An Estimation of Trade Coefficients

Each region purchases commodities produced in other regions. The percentage of a commodity received from each region is called trade coefficients. The trade coefficients are region by region table for each commodity flow. An estimation of trade coefficients requires complete set of interregional trade flows. The census of transportation, Carload way bill Statistics, Waterborne Commerce of the U.S., Census of Mineral Industries, and Census of Manufacturers provide the basic data for the trade flows estimation. Major problem of estimating the trade flows from these sources is that it is too much time consuming. Each census is using diffirent accounting frameworks and different industrial classification, it takes a great deal of efforts to make them consistent each other.

Alternatively, the trade coefficients can be estimated from the commodity received and the commodity shipped. The commodity received is the column sum and the commodity shipped is the row sum of the trade flows. The commodity shipped is approximately by the industrial output produced (x_j^r) and the commodity received (R_j^r) is estimated by summing final demand received (y_i^r) and the intermediate inputs received ($\Sigma_s \Sigma_j x_{ij}^{sr}$) in the region.

Based on x_j^r and R_j^r, the trade coefficients are estimated. There are three methods to estimate the trade coefficients.

First method is to employ the linear transportation cost minimization algorithms. This approach requires the estimation of cost delivering a commodity between region. Distance between two regions (or combined area of two region is the popular proxy to the cost estimation; the trade flow (x_i^{sr}) for the commodity i is computed from the following model;

$$\text{Min } \Sigma\Sigma\, c_i^{sr} \cdot x_i^{sr}$$

Subject to

$$\Sigma_s\, x_o^{sr} \geq R_i^r$$

$$\Sigma_r\, x_i^{sr} \leq x_i^s$$

$$x_i^{sr} \geq 0$$

The complementary pivot algorithms (Dantzig - Cottle algorithm) efficiently compute this computation. The compulational routines used for this computation are LEMKE, PIVOT, DECOM, and SORT which are in Appendix III. Second method is to use a modified version of the gravity model. The usual gravity model computes the trade flows by the following equations;

$$x_i^{sr} = \frac{x_i^s\, R_i^r}{x^i} \frac{1}{c_i^{sr}}$$

where $x_i = \Sigma_s\, x_i^s = \Sigma_r\, R_i^r$

This trade flow (x_i^{sr}) is scanned by the RAS method so that the row sum of the trade flows becomes x_j^r and the column sum becomes R_i^r.

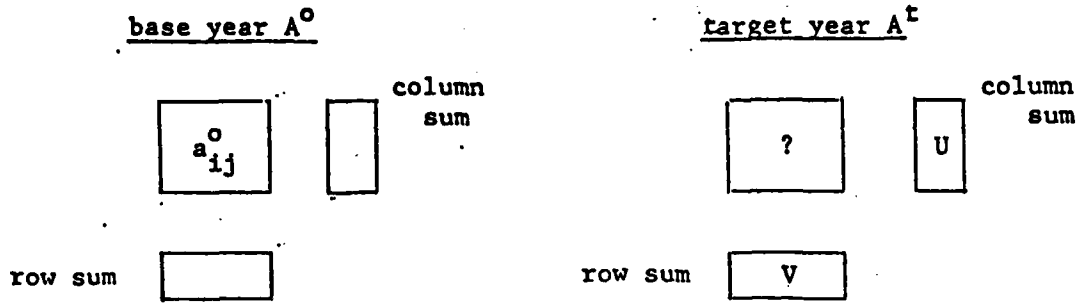
Third method is to use a base year trade flows and to update the trade flows at the target year. Kim (1977) has compiled 1963 trade flows data which was revised from Polenske's data (Polenske (1970)). This data was updated in 1972 level by using the RAS method. In this study the trade coefficients are estimated by the third method.

In RAS, the column sum of the table is equal to the regional output received and the row sum becomes the regional output produced. The RAS method requires base year data and target year row and column sums. Using the 1972 output received and output produced as the target year row sum and column sum we update the 1963 trade flows to the 1972.

The 1963 trade flows were aggregated from 79 commodities to 35 commodities into Oklahoma, Arkansas and the rest of the U.S. Using the output shares between water and non-water as the prorate variable, Oklahoma trade flows were further disaggregated into the water, the non-water regions of Oklahoma. Similarly, the Arkansas trade flows were disaggregated into the water and the non-water regions in Arkansas. Then the trade flows of the water counties are obtained by combining those of Oklahoma and Arkansas. Similarly the trade flows of the non-water regions of Oklahoma and Arkansas are obtained. Thus three regions, 35 commodity trade coefficients are obtained. By means of RAS, 1963 trade coefficients are updated to 1972 trade coefficients.

The RAS is computed as follows:

(ref: Bacharach, M. Biproportional Matrices and input-output change, Cambridge, 1970)



$$(1)\quad r_i = \frac{U_i}{\sum_j a^o_{ij}}$$

$$(2)\quad a^1_{ij} = r_i\, a^o_{ij}$$

$$(3)\quad s_j = \frac{V_j}{\sum r_i \cdot a^o_{ij}}$$

$$(4)\quad a^2_{ij} = r_i \cdot a^o_{ij} \cdot s_j$$

(5) If $|\ \mathrm{Min}\{r, s\} - 1\ | \leq \varepsilon$, then stop.

Otherwise, set $a^o_{ij} = r_i\, a^o_{ij}\, s_j$ and iterate again.

(5.5) Estimation of Industrial Price, Wage Rate and Service Price of Capital

The industrial prices, wage rates, and the service prices of capital for the period of 1968 to 1978 are estimated. These price data are required to evaluate the economic impact of the Arkansas Navigation System on water counties, rest of Arkansas and Oklahoma and the rest of the U.S.

The industrial prices and the wage rates for the period of 1967 to 1978 are gathered first. Based on these prices, the service prices of capital are computed for the same period.

The price indices of the industrial goods are mainly gathered from the Handbook of the Labor Statistics. It was supplemented by Oklahoma Agricultural

Statistics, and Oklahoma Energy Assessment and Forecasting.

The Employment and Earnings published by the Bureau of the Labor Statistics is the main source of the wage data. Farm wage rates were gathered from the Agricultural Statistics.

The service price of capital is not available. It was estimated from the wage and the price series by using the Divisia Index Method. The Divisia Index is the best known method for such computation;

we define;

P: price index of the industrial output

w: wage index of the wage rate

r: the service price index of capital (the service of capital includes the lands, machines, and plants)

s_L = the value added share of the wage payment

s_K = the value added share of the non-wage payment (since the indirect taxes are excluded from the value added, $(s_L + s_K)$ becomes a unity)

From the Divisia Index,

$$\log (r/r_{-1}) = \frac{1}{s_K} (\log P/P_{-1}) - s_L \log (w/w_{-1}))$$

The log is a natural log. To make it consistent with other series, we set the 1972 service price of capital index equal to 100. (i.e., 1972 becomes a base year). We also establish 1972 as a base year for all other price indexes. Since $\log (r/r_{-1})$ is a rate of change in the service price of capital and the 1972 service price is 100, the service prices of all other years can be computed. These three price indices are needed to measure the economic impact of the Arkansas Navigation System.

Chapter 6

Estimation of Lowered Transportation Cost

The basis for our estimates of the economic development impacts of the McClellan Kerr Arkansas River Navigation Project is derived from the percent savings in total transport costs due to the project. The estimates of savings in transport costs were provided by IWR (Institute of Water Resources) based on surveys done by Resources Management Inc. (Tulsa, Oklahoma), Richard Bigda Associations (Tulsa, Oklahoma), and University of Missouri (Rolla, Missouri). These surveys gathered the data on all shipments in and out of the firm, by all modes. The selection of firms to be interviewed was a stratified random sample of firms in each two digit SIC group such that at least 50 percent of total employment in each SIC was included. As a control, the estimates of trade flows by I-O Sector and among the 3 regions of the I-O Model were utilized. Another control was Waterway Statistics produced by the Corps of Engineers which shows total waterway flows by commodity. Following information was gathered from the sample surveys.

1. Primary SIC Code of firm at 4 digit level
2. Tons shipped each year by origin & destination
3. Transit time for shipment
4. Value of shipment per ton
5. Transport mode utilized for shipment
6. Transportation rate by selected mode
7. Handling costs, those costs in excess of the transport rate necessary for the shipment
8. Distance by the chosen mode

Total costs of shipment were derived by adding hauling costs, terminal costs and time costs. Each cost was computed as follows;

(a) Hauling costs = (rate per ton-mile) * (tons shipped) * (distance in miles)

(b) Terminal costs = (handling costs per ton) * (tons shipped)

(c) Time costs = (value of time) * (time in transit) * (value of shipment)

Time costs reflect the carrying costs of the goods during transit computed at 18 percent per year.

Total transport costs were estimated for each 4-digit SIC industry group reflected in the sampel survey and aggregated for the thirty-five sector input output model. The cost of transporting commodities in the absence of the waterway was determined by estimating the cost of the mode which could move the shipment most economically. Origin and destination were assumed to remain fixed.

Flow of a commodity between regions was identified on the basis of those surveys. For example, soybean which belongs to oil bearing crop sector was shipped mostly from waterway counties to the rest of the U.S. In 1978, $1.98 million of transportation cost was saved by the waterway shipment of soybeans. 89.3 percent of the soybean shipment was made between waterway counties to the rest of the U.S. and the remaining 10.7 percent from the rest of the Oklahoma and Arkansas to the rest of the U.S.

In the case of grains, productive soils suitable for cash crop production occur at each end of the McClellan-Kerr System while the area between Little Rock, Arkansas and Sallisaw, Oklahoma is an importer of grain to feed chickens and other livestock. At the lower end of the waterway grain shippers can choose between shipping on the Arkansas White and Mississippi river systems. In the upper waterway, grain is traveled up to 150 miles by truck from Kansas and Oklahoma counties to elevators on the waterway. Rail competition to Houston via Enid, Oklahoma blocks shipment further west about 80 miles west

of Tulsa. This results in a competitive crescent that extends further north in Kansas where truck hauls up to 150 miles have been made to ship grain at Catoosa. No transshipment by rail to the waterway has developed, although the Tulsa Port of Catoosa has rail handling facilities to transfer grain between rail and barge. Outgoing grain shipments therefore are hauled solely by truck for an average of 40-80 miles to Catoosa and downstream to Oklahoma waterway grain terminals and about 40 miles in the lower end of the waterway. During 1978, the grain industry saved $1.39 million of the shipping cost by the waterway transportation.

Residual fuel oil is a large user of the waterway, increasing to about 2 million tons in 1978. In 1978, $15.68 million of transportation cost was saved by the waterway transportation. Approximately 37 percent of the petroleum shipment originated from Oklahoma waterway counties and shipped downstream to the Little Rock area which is still in the waterway counties. Another 37 percent of petroleum shipments originated outside of the waterway counties delivered to downstream waterway counties. The remaining 26 percent of petroleum trade was made between the rest of Oklahoma and Arkansas and the rest of the U.S.

Fertilizers and caustic soda comprised the largest share of chemical items carried by barge. Fertilizer users saved approximately $7 million by waterway shipment in 1978. During the same year, the transportation cost saving by the caustic soda was estimated to be $2.4 million. It implies that if these chemical products were shipped by rail and truck, the industry would have paid $9.4 million more transportation costs. Caustic soda originated in the rest of the U.S. and was delivered to the waterway counties and to the rest of Oklahoma and Arkansas. However, half of the fertilizer trade originated in the waterway counties and delivered to the rest of Oklahoma and Arkansas and the rest of the U.S. The other half was produced by plants located in the rest of the U.S., and shipped

to the waterway counties and the rest of Oklahoma and Arkansas. These products are heavily used as intermediate inputs to many industries. Because of this reason, the transportation cost change in chemical industry is very sensitive to the industrial output.

Both metallurgic and steam coal are frequently shipped by the waterway. The coal shipments by waterway are mostly from coal mines in the waterway counties to the industrial plants located in the rest of the U.S. The transportation cost saving of the coal shipment was estimated to be approximately $6.53 million in 1978.

The waterway is very competitive to ship heavy and bulky items. Because of this reason, iron and steel products were intensively shipped by the waterway during the sample period of 1974-1978. Most of these steel products were produced by plants in the rest of the U.S. and shipped to the industries located in the waterway counties and the rest of Arkansas and Oklahoma. In 1978, the transportation cost saving by primary metal products was approximately $3.89 million.

Sand, gravel, rocks which were heavily used for construction and for waterway improvement are substantial tonnage carried by the waterway. Aggregates generally involve short waterway hauling distances. Some materials used in the waterway improvement were hauled from the waterway counties to the local Mississippi river basin. Bauxite (actually alumina) is another item frequently shipped by the waterway. The material is imported from South America through New Orleans, shipped to Little Rock by barge and to Bauxite plants in Arkansas by trucks. If the waterway was not available, the material would be shipped to Mobil and from Mobil, it would be shipped to Bauxite plants in Arkansas by rail. The alumina is mixed with natural bauxite about three to one ratio for processing intermediate products or into alumina. Combined transportation

cost saving estimated to be approximately $7.10 million in 1978.

Much of the transportation cost savings are subject to sampling errors. For year 1978, we provide low, middle, and high estimates so that we may trace the sensitivity of the transportation cost on industrial output.

Total transportation cost saving varied year to year. The saving was $33.21 million in 1974 and declined to $22.76 in 1975. It steadily increased to $32.20 million in 1976, $51.51 million in 1977, and $50.06 million in 1978.

Table 6.1 provides the complete statistics on the transportation cost savings by each commodity shipped by the waterway.

To what extent does the transportation cost saved by each commodity reduce the industry's transportation cost? For example, petroleum refining and related industry (no. 15) includes various kinds of petroleum products, most of which are shipped by pipelines, truck, rail and barge. The petroleum product shipped mostly by the waterway is residual fuel oil for power plants.

The trade flow of the petroleum products within the waterway counties was $2671.17 million. The amount of transportation cost saving because of the use of the waterway within the waterway counties was estimated to be around $5,765 thousands. Therefore, the transportation cost saving for this transaction is approximately 0.2158 percent (= 5.765 * 100/2671.17).

Similarly, total shipment of petroleum products from the rest of Arkansas and Oklahoma to the waterway counties valued approximately $862.98 million in 1978. Some portion of shipment was made by the waterway. If the waterway wasn't built, the petroleum products would have been shipped by alternative modes with an estimated additional cost of $5.7 million. Therefore, with the waterway, the petroleum industry saved 0.6682 percent (= 5.765% * 100/862.98) of the transportation cost from its shipment from the rest of Arkansas and Oklahoma to the waterway counties.

(Table 6.1)

Petroleum Trade Flows

and Transportation Cost Saving

in 1978

(unit: million dollars)

	Receiving Region					
	The Waterway Counties		The Rest of Arkansas and Oklahoma		The Rest of the U.S.	
Shipping Region	trade	tc savings	trade	tc savings	trade	tc savings
The Waterway Counties	2671.17	.05765	225.65	-	677.94	-
The Rest of Arkansas and Oklahoma	862.98	.05765	135.88	-	309.85	.02076
The Rest of the U.S.	887.29	-	271.07	.02076	56560.14	-
Total	4421.44	.1153	632.60	.02076	57547.93	.02076

(Table 6.2)

Chemical Trade Flow in 1978

(unit: million dollars)

	Receiving Region		
Shipping Region	The Waterway Counties	The Rest of Arkansas and Oklahoma	The Rest of the U.S.
The Waterway Counties	40.506	36.112	32.066
The Rest of Arkansas and Oklahoma	221.708	248.824	244.217
The Rest of the U.S.	1457.872	1768.043	91604.360
Total	1720.086	2052.979	91188.643

The chemical trade flow matrix shows that the waterway counties imported $221.7 million of chemical products from the rest of Arkansas and Oklahoma and $1457.9 million from the rest of the U.S. The rest of Arkansas and Oklahoma imports $36.1 million of chemical products produced by the plants located in the waterway counties and $1768 million from the rest of the U.S. This trade flow table shows the actual amount of transaction of chemical products among regions. The waterway saved the transportation cost as shown in Table 6.3

We estimated value of shipment of each commodity and computed the transportation cost savings. The percentage of transportation cost saving becomes smaller as the small portion of the commodity or small number of commodities within the industry group is shipped by the waterway. For example, the chemical industry (no. 14) in the model includes various kinds of chemical products (SIC 27), plastic (SIC 28), drugs (SIC 29), and paints (SIC 30). However, the chemical products shipped by the waterway are limited to sodium hydroxide (caustic soda), chemical fertilizers, synthetic rubber, alcohols, and other basic chemicals. The rest of Arkansas and Oklahoma has imported $36,112, thousand of chemical products from the waterway counties and the rest of the U.S. imported $32,066 thousand from the waterway counties in 1978. The transportation cost savings because of the waterway were $1,432 thousands from the waterway counties to the rest of Arkansas and Oklahoma and $2,043 thousands from the waterway counties to the rest of the U.S. Therefore, the percentage of transportation cost saving for chemical industry was computed by dividing the transportation cost saving because of the waterway by the value of shipment involved in the trading. The chemical industry saved 3.964 percent (= 1,432 * 100/36,112) from its shipment from the waterway counties to the rest of Arkansas and Oklahoma and saved another 6.371 percent (= 2.043 * 100/32,066) from the waterway counties to the rest of the U.S.

The percentage of transportation cost saving because of the waterway was estimated in that manner for all commodities. However, for two cases (chemical shipment from the rest of the U.S. to the waterway counties and its shipment from the rest of the U.S. to the rest of Arkansas and Oklahoma region), the estimates appear to be biased downward. We found that the value of shipment represented by our surveys and the estimate of value of shipment in the input-output tables were significantly different. We therefore used the sample data to estimate percentage reduction total costs of chemical shipment among three regions.

(Table 6.3)

1978 Transportation Cost Saving ($: 000)

15. Petroleum

Origin	Destination	%	Saving H	Saving M	Saving L
1	1	36.76	7,013	5,765	4,510
2	1	36.76	7,013	5,765	4,510
2	3	13.24	2,526	2,076	1,624
3	2	13.24	2,526	2.076	1,624
		100.00	19,077	15,682	12,268

25. Coal

Origin	Destination	%	Saving H	Saving M	Saving L
1	3	93.95	23,843	6,140	4,510
2	3	6.05	1,535	395	290
		100.00	25,378	6,535	4,800

5. Grain

Origin	Destination	%	Saving H	Saving M	Saving L
1	3	50.00	871	695	515
2	3	50.00	871	695	515
		100.00	1,741	1,390	1,030

6. Oil bearing crops

Origin	Destination	%	Saving H	Saving M	Saving L
1	3	89.28	2,215	1,768	1,311
2	3	10.72	266	212	157
		100.00	2,481	1,980	1,468

Note on O-D pair: 1 - Waterway counties
2 - Rest of Arkansas and Oklahoma
3 - Rest of the U.S.

1978 Transportation Cost Saving (continued)

14. Chemicals
    a) Fertilizer and all others

Origin	Destination	%	Saving H	Saving M	Saving L
1	2	20.60	2,092	1,432	772
1	3	29.40	2,985	2,043	1,102
3	1	29.40	2,985	2,043	1,102
3	2	20.60	2,092	1,432	772
		100.00	10,154	6,950	3,747

14. Chemicals
    b) Caustic Soda

Origin	Destination	%	Saving H	Saving M	Saving L
3	1	50.00	1,646	1,204	762
3	2	50.00	1,646	1,204	762
		100.00	3,291	2,407	1,523

Combined Savings

Origin	Destination	%	Saving H	Saving M	Saving L
1	2	NA	2,092	1,432	772
1	3	NA	2,985	2,043	1,102
3	1	NA	4,631	3,247	1,864
3	2	NA	3,738	2,636	1,534
			13,445	9,357	5,270

19. Primary Metal Products
    a) Scrap metal

Origin	Destination	%	Saving H	Saving M	Saving L
1	1	100.00	1,169	948	728

    b) Steel

Origin	Destination	%	Saving H	Saving M	Saving L
3	1	90.00	3,443	2,650	1,854
3	2	10.00	383	295	206
		100.00	3,826	2,945	2,060

1978 Transportation Cost Saving (continued)

Combined Savings

Origin	Destination	%	Saving H	Saving M	Saving L
1	1	NA	1,169	948	728
3	1	NA	3,443	2,650	1,854
3	2	NA	383	295	206
			4,995	3,893	2,788

27. Other Mining
    a) Water improvement materials

Origin	Destination	%	Saving H	Saving M	Saving L
1	3	100.00	3,302	2,626	1,943

b) Aggregate

Origin	Destination	%	Saving H	Saving M	Saving L
1	1	100.00	1,946	1,497	1,048

c) Bauxite

Origin	Destination	%	Saving H	Saving M	Saving L
3	2	100.00	8,935	7,104	5,273

Combined Savings

Origin	Destination	%	Saving H	Saving M	Saving L
1	1	NA	1,946	1,497	1,048
1	3	NA	3,302	2,626	1,943
3	2	NA	8,935	7,104	5,273
			14,183	11,227	8,264

	H	M	L
Total Transportation Saving	81,300	50,064	35,888

1974-1977 Transportation Cost Saving ($: 000)

15. Petroleum

Origin	Destination	%	Saving 1974	1975	1976	1977
1	1	36.76	2,267	1,301	3,775	6,088
2	1	36.76	2,267	1,301	3,775	6,088
2	3	13.25	817	469	1,359	2,193
3	2	13.24	817	469	1,359	2,193
		100.00	6,168	3,539	10,268	16,562

25. Coal

Origin	Destination	%	Saving 1974	1975	1976	1977
1	3	93.95	818	607	971	2,130
2	3	6.05	53	39	62	137
		100.00	871	646	1,033	2,267

5. Grain

Origin	Destination	%	Saving 1974	1975	1976	1977
1	3	50.00	491	478	625	726
2	3	50.00	491	478	625	726
		100.00	982	956	1,250	1,451

6. Oil Bearing Crops

Origin	Destination	%	Saving 1974	1975	1976	1977
1	3	89.28	1,250	1,217	1,590	1,845
2	3	10.72	150	146	191	221
		100.00	1,400	1,363	1,781	2,066

14. Chemicals
a) Fertilizer and all others

Origin	Destination	%	Saving 1974	1975	1976	1977
1	2	20.60	734	664	733	916
1	3	29.40	1,048	947	1,047	1,307
3	1	29.40	1,048	947	1,047	1,307
3	2	20.60	734	664	733	916
		100.00	3,563	3,221	3,560	4,445

1974-1977 Transportation Cost Saving (continued)

14. Chemicals
    b) Caustic Soda

Origin	Destination	%	Saving 1974	1975	1976	1977
3	1	50.00	791	783	787	1,148
3	2	50.00	791	783	787	1,148
		100.00	1,582	1,566	1,574	2,295

Combined Savings

Origin	Destination	%	Saving 1974	1975	1976	1977
1	2	NA	734	664	733	916
1	3	NA	1,048	947	1,047	1,307
3	1	NA	1,839	1,730	1,834	2,455
3	2	NA	1,525	1,447	1,520	2,064
			5,145	4,787	5,134	6,740

19. Primary Metal Products
    a) Scrap Metal

Origin	Destination	%	Saving 1974	1975	1976	1977
1	1	100.00	487	14	313	250

    b) Steel

Origin	Destination	%	Saving 1974	1975	1976	1977
3	1	90.00	1,493	1,168	1,655	2,233
3	2	10.00	166	130	184	248
		100.00	1,659	1,298	1,839	2,481

Combined Savings

Origin	Destination	%	Saving 1974	1975	1976	1977
1	1	NA	487	14	313	250
3	1	NA	1,493	1,168	1,655	2,233
3	2	NA	166	130	184	248
			2,146	1,312	2,152	2,731

1974-1977 Transportation Cost Saving (continued)

27. Other Mining
    a) Water improvement materials

Origin	Destination	%	Saving 1974	1975	1976	1977
1	3	100.00	5,387	1,830	2,174	3,836

b) Aggregate

Origin	Destination	%	Saving 1974	1975	197[illegible]	1977
1	1	100.00	1,116	1,161	1,164	1,400

c) Bauxite

Origin	Destination	%	Saving 1974	1975	1976	1977
3	2	100.00	9,995	7,172	7,247	14,459

Combined Savings

Origin	Destination	%	Saving 1974	1975	1976	1977
1	1	NA	1,116	1,161	1,164	1,400
1	3	NA	5,387	1,830	2,174	3,836
3	2	NA	9,995	7,172	7,247	14,459
			16,498	10,163	10,585	19,695

	1974	1975	1976	1977
Total Transportation Saving	33,210	22,766	32,203	51,512

(Table 6.4)

The Percentage of Transportation

Cost Savings

(unit: percent)

	Commodity	Origin	Destination	1978 High	1978 Medium	1978 Low	1977	1976	1975	1974
15.	Petroleum	1	1	0.2626	0.2158	0.1689	0.2625	0.462	0.2299	0.221
		2	1	0.8129	0.6682	0.5228	0.8128	1.43	0.7118	0.6841
		2	3	0.8153	0.6700	0.5242	0.7901	0.555	0.2174	0.4014
		3	2	0.4318	0.7658	0.599	1.048	0.1269	0.0429	2.709
25.	Coal	2	3	7.243	5.169	3.795	2.288	1.094	0.7917	1.372
		1	3	20.09	18.65	13.70	8.257	3.977	2.686	4.915
5.	Grain	1	3	0.5272	0.4207	0.3117	0.1107	0.3639	0.2475	0.2402
		2	3	0.1301	0.1038	0.0769	0.0543	0.0898	0.061	0.059
6.	Oil Bearing	1	3	1.925	1.536	1.139	1.871	1.734	1.494	1.214
		2	3	0.056	0.045	0.0331	0.054	0.0505	0.043	0.035
14.	Chemicals	1	2	5.792	3.964	2.137	2.315	0.8286	0.9043	1.560
		1	3	9.309	6.371	3.437	4.477	4.070	4.105	4.724
		* 3	1	4.278	3.000	1.723	3.000	3.00	3.00	3.00
		* 3	2	4.287	3.000	1.745	3.000	3.00	3.00	3.00
19.	Primary Metal	1	1	0.674	0.5466	0.4197	0.5946	0.5569	0.407	0.3347
		3	1	0.650	0.500	0.350	0.618	0.3426	0.3951	0.1194
		3	2	0.028	0.0218	0.0153	0.020	0.0361	0.1489	0.0415
27.	Other Mining	1	1	48.41	37.24	26.07	32.58	29.26	34.14	50.73
		1	3	10.73	8.533	6.314	15.47	9.194	8.427	27.53
		3	2	9.427	7.495	5.563	13.96	7.462	8.690	16.47

* Normal transportation costs based on survey rather than trade flow estimates.

Note
1 - Waterway Counties
2 - Rest of Arkansas and Oklahoma
3 - The Rest of the U.S.

(Table 6.5)

Ton's Shipment by Commodity Group
in 1977

Commodity		Shipments (000 tons)
15.	Petroleum	2,037
25.	Coals	531
5.	Grain (Wheat, Rice, Corn ..)	419
6.	Oil Bearing (Soybeans)	620
14.	Chemicals	595
19.	Primary Metal	332
27.	Other Mining	3,517
	(Ores and Minerals 761)	
	(Aggregates 2,756)	
	All Others	1,094
	Total Shipment	9,145

Chapter 7

Empirical Findings

The following chapter summarizes the results of reductions in transport costs discussed in Chapter 6 on output, employment, tax receipts and trade flows and other factors in the three regions and across 35 industry sectors. The regions are: the waterway counties - 28 waterway counties in Arkansas and Oklahoma, the rest of Arkansas and Oklahoma - remaining counties in Arkansas and Oklahoma, and the rest of the U.S. - remaining 48 states of the U.S. and the District of Columbia (see Map 1). The resulting multiregional variable input-output model is based on the 1972 National Input-Output Tables published by the U. S. Department of Commerce. The national tables were developed with 496 sectors which were aggregated to 35 sectors for the input-output model and regional tables were based on industry detail at the 2 digit SIC level. Chapter 5 discusses the details of the adjustments made to the technical requirements matrix and to update trade flow and final demand relationships.

From chapter 4, the industrial output is determined by the following balance equations,

$$x = (I-TA)^{-1}F \qquad (4.22)$$

where x = output

T = trade flows among regions (a matrix of trade coefficients).

A = Input to output ratios by each industry sector (a matrix of technical coefficients).

F = Value of shipments to final demand sector

I = Diagonal unit matrix (an identity matrix).

This model shows that a change in T (trade flows) and A (technical relations) will produce a change in industrial output (x). Changes in transportation cost alters the trade structure and the technical coefficients as industries act to achieve the most economical mix of inputs to produce their

output. Industries in each region could purchase less expensive intermediate inputs to produce their output if transportation costs are lowered and the lowered input costs allow them to produce output at lower costs. The industry thus favored has a comparative advantage which allow them to expand sales to all regions. The model estimates equilibrium shift in output costs, equilibrium change in output and equilibrium change in trade flows from the input-output table by taking the inverse of the (I-TA) matrix and multiplying it by the final demand shipped (F).

Table 7.1 shows the 35 sector industrial classification used in the model. We also show SIC classification which compares with input-output sector codes. Dummy industries (81, 82, 83), nongovernment special industries (84, 85), and noncomparable inports (80) were reallocated by using the method suggested by McCarthy (1967). In the subsequent sections we discuss the results of the model.

(7.1) Impacts on Industrial Output.

The model shows gross output increase by an average of $118.8 million due to transport cost savings of averaging $37.95 million for analysis period of 1974-1978. These transportation costs savings are those accruing to users of the McClellan-Kerr Arkansas waterway. Increases in output are larger for rest of U.S. than waterway counties and rest of Arkansas and Oklahoma. The average increase in industrial output was $19.82 million for the waterway counties $20.01 million for the rest of Arkansas and Oklahoma, and $78.87 million for the rest of the U.S. This unexpected result due to the substantial degree of openness of trade between the waterway counties and the rest of Arkansas and Oklahoma with the rest of the U.S. and, as we will see later in the evaluation of the impacts, that trade volume is increased due to the waterway. Table 7.2 shows a summary of increases in estimated output for years 1974 through 1978.

(Table 7.1)

The 35 Sector Industrial Classification

		SIC CODE	OBE CODE
Agriculture			
1.	Dairy farm products	*	(0101)
2.	Poultry and eggs	*	(0102)
3.	Meat animal and products	*	(0103)
4.	Cotton	*	(0201)
5.	Food and feed grains	*	(0202)
6.	Oil bearing crops	*	(0206)
7.	Misc. agricultural, forestry and fishery	*	(0203-0205,0207, 0300,0400)
Manufacturing			
8.	Food and kindred products	20	(14,15)
9.	Apparel and textile products	22	(16-19)
10.	Lumber and wood products	24	(20,21)
11.	Furniture and fixtures	25	(22,23)
12.	Paper and allied products	26	(24,25)
13.	Printing and Publishing	27	(26)
14.	Chemical and allied products	28	(27-30)
15.	Petroleum and allied products	29	(31)
16.	Plastic, rubber	30	(32)
17.	Leather	31	(33,34)
18.	Stone, clay, and glass products	32	(35,36)
19.	Primary metal products	33	(37,38)
20.	Fabricated metals	34	(39-42)
21.	Machinery except electrical	35	(43-52)
22.	Electrical equipment	36	(53-58)
23.	Motor vehicle and transportati equipment	37	(59-61)
24.	Miscellaneous manufacturing	89	(13,62-64)
Mining			
25.	Bituminous Coal	11,12	(7)
26.	Crude Petroleum and natural gas	13	(8)
27.	Other mining except petroleum, gas and coal	10,14	(5-6,9-10)
Service Related Industries			
28.	Contract construction	15-17	(11,12)
29.	Transportation and warehousing	41-47	(65)
30.	Wholesale and retail trade	50-59	(69)
31.	Finance, insurance, and real estate	60-66	(70,71)
32.	Communications, radio, and TV Broadcasting	48	(66,67)
33.	Electric, gas, and sanitary services	49	(68)
34.	Hotel and other services	70-89	(72-77)
Government			
35.	Government	4311,613,491	(78,79,82)

* 01 ∿ 09

(Table 7.2)

Summary of Estimated Changes in Output
by Year from Transport Cost Savings Provided by
McClellan-Kerr Arkansas River Navigation System (Unit: million dollars)

Year		Transport Cost Savings	Change in Output: 28 Water Counties	Change in Output: Rest of Arkansas and Oklahoma	Change in Output: Rest of U.S.	Change in Output: Total U.S.
1974		33.21	18.50	20.07	72.70	111.27
1975		22.76	13.36	15.00	63.16	91.52
1976		32.20	17.06	18.00	66.58	101.64
1977		51.51	22.64	22.71	89.95	135.30
1978	Low	(35.89)	(18.90)	(16.13)	(63.97)	(99.00)
	Base	50.06	27.54	24.82	102.00	154.36
	High	(81.30)	(42.37)	(34.91)	(150.50)	(227.78)
Annual Average		37.95	19.82	20.01	78.87	118.82

These impacts represent the impacts of reduced transport costs from the accounting point of view of transportation users in the three regions. Net increases to the economy would necessarily have to account for the costs, since the public resources expended to build and operate the system could have been invested in alternative ways (including other waterways) which would also produce multiple effects. The impacts identified above show what occurred in the MRVIO model when actual transport cost savings to shippers are used in the model. We believe that they represent a realistic set of assumptions with regard to the question; What kinds of impacts has the McClellan-Kerr Arkansas River Navigation System had on industrial output due to the transport savings which accrue to transport users?

What are the industries which were benefited most by the waterway transportation?

The "other mining" sector is the most conspicious gainer in the waterway counties. In 1978, the industry was stimulated to produce additional $5.6 million because of the waterway transportation. Transportation of aggregates (sand, gravel, rock), the material used in the waterway improvement, and bauxite contributed the growth of the "other mining" sector in the waterway counties. Coal, chemical, petroleum, primary metal, and grain sectors are also strong gainers due to the waterway transportation. In 1978, the coal industry increased its output as much as $3.2 million, followed by chemical $2.6 million; petroleum, $2.3 million; primary metal, $2.2 million, and grains, $1.3 million due to the waterway.

In the rest of Arkansas and Oklahoma grain farms is the most benefited industrial sector. The waterway transportation stimulated the grain industry to produce an additional $3.8 million output in 1978. "Other farm" industry is also benefited by the waterway transportation and increased its output as much as $3.7 million. Large shipments of wheat, soybeans, rice, corn, and sorghum grain directly and indirectly benefited agriculture. Poultry-eggs and meat animal producers were indirectly benefited by the waterway since feed costs were lowered. Agricultural chemicals and fertilizer costs were also reduced by the waterway.

Chemical, petroleum, plastic, and primary metal sectors are strong gainers because of waterway transportation. Chemical, petroleum, and primary metal industries are gainers of the direct shipment of their products by the waterway, and the plastic industry was benefited by the lower cost chemical inputs. The chemical industry increased its output by $3 million because of the waterway. Petroleum, plastic, and primary metal industries also increased their

outputs by $2.7 million, 2.3 million, and $1.4 million in 1978 respectively.

The waterway contributed greatly the industrial expansion of the remainder of the U.S. Almost half of the added output was from the chemical industry which increased output by $53 million because of the McClellan waterway. The primary metal sector is the second largest gainer and increased its output by $11.8 million due to the waterway. The other major gainers are service ($5.9 million), other mining ($5.4 million), utility ($4.3 million), food processing ($3.2 million), and petroleum ($3.0 million).

The most industrial gainers in 1978 are in percentage-wise, "other mining" (13.88%), chemicals (2.39%), coals (1.95%), oil bearing crops (0.85%), and "other farms" (0.68%) in the waterway counties. In the rest of Arkansas and Oklahoma in 1978 the percentage increase in industrial outputs was the largest in petroleum (0.73%) followed by other farms (0.67%), cotton (0.49%), chemicals (0.42%), and plastic (0.36%). There was no direct shipment of cotton by the waterway in 1978. However, the cotton industry was indirectly stimulated because of its use of chemical fertilizers which have been shipped in a great deal by the waterway transportation. The largest gainers in the rest of the U.S. in 1978 is chemical industry which increased output by 0.056 percent because of the waterway.

In general, the industries in the waterway counties had the largest percentage gains because the waterway counties depend on interregional trade for most of their economic activities. Since trade with the waterway counties is a relatively small fraction of U.S. economic activity, the percentage impact is small in the rest of the U.S.

A one dollar purchase in final demand creates a chain effect on the economy. For example, a one dollar grain sale to Russia requires the grain farmers to produce more grain. To do so, they need to purchase more fertilizer. Then the chemical industry needs to consume more electricity and the

(Table 7.3)

The Five Most Gainers by the Lowered Waterway Transportation Costs (Demand Adjusted Model)

1974	1976	1978
A) Waterway Counties		
1. Other Mining (33.60)*	1. Other Mining (9.31)	1. Other Mining (13.88)
2. Chemicals (1.89)	2. Chemicals (1.25)	2. Chemicals (2.39)
3. Coals (1.68)	3. Other Farm (0.94)	3. Coals (1.95)
4. Other Farms (0.80)	4. Coals (0.75)	4. Oil Bearing (0.85)
5. Grains (0.56)	5. Cotton (0.43)	5. Other Farms (0.68)
B) The Rest of Arkansas and Oklahoma		
1. Other Farm (0.92)	1. Other Farm (0.95)	1. Petroleum (0.73)
2. Coal (0.65)	2. Cotton (0.42)	2. Other Farm (0.67)
3. Other mining (0.55)	3. Chemicals (0.32)	3. Cotton (0.49)
4. Grains (0.51)	4. Plastic (0.32)	4. Chemicals (0.42)
5. Stone, Clay (0.46)	5. Primary Metal (0.27)	5. Plastic (0.36)
C) The Rest of the U.S.		
1. Other Mining (0.067)	1. Chemical (0.051)	1. Chemical (0.056)
2. Chemical (0.055)	2. Other Mining (0.033)	2. Other Mining (0.037)
3. Petroleum (0.013)	3. Primary Metal (0.007)	3. Primary Metal (0.011)
4. Primary Metal (0.008)	4. Coals (0.003)	4. Coal (0.006)
5. Oil and Gas (0.006)	5. Rubber (0.003)	5. Petroleum (0.005)

*The figures inside parenthesis indicate the percentage increase in output by the lowered transportation cost.

electricity industry needs to generate more electricity. Industries depend on each other. How much output each industry could produce more when there is one dollar increase in every component of final demand is conveniently measured by the output multipliers.

In general, as the industry purchases more intermediate inputs to its sales, the industry's output multiplier becomes larger. The government industry which spends approximately 6.4% of its sales for the purchase of intermediate input has the smallest output multiplier (1.12 for all three regions). The poultry and eggs sector which spends approximately 88% of its sales for the intermediate purchases has the largest output multipliers (3.15 for the waterway counties, 3.14 for the rest of Arkansas and Oklahoma, and 2.92 for the rest of the U.S.) table 7.4 shows those multipliers.

(7.2) Impact on Gross Regional Products, Wage Payment, and Tax Receipts

How could the decrease in transportation cost affect the gross regional product, wage payments, and tax receipts? It expands the industrial output which increases the gross regional product, wage payment, and tax receipt. The gross regional product is sum of the "value added" by each industry in the region.

In 1978, the gross regional product increased $10.67 million in the waterway counties, $7.75 million in the rest of Arkansas and Oklahoma, and $43.95 million in the rest of the U.S. due to the waterway. These increases in gross regional product are due to the lowered transportation cost. Estimated wage payment increased $6.2 million in the waterway counties, $3.6 million in the rest of Arkansas and Oklahoma, and $25.5 million in the rest of the U.S. Excise tax receipt has boosted by 0.51 million in the water region, 0.48 million in the non-water region, and 2.5 million in the rest of the U.S.

(Table 7.4)

The Output Multipliers
in 1972

		The Waterway Counties	The Rest of Arkansas and Oklahoma	The Rest of U.S.
1.	Dairy Farm	2.709	2.781	2.142
2.	Poultry and Eggs	3.153	3.144	2.918
3.	Meat Animals	2.913	2.915	2.937
4.	Cotton	2.425	2.424	2.264
5.	Grains	2.263	2.102	1.869
6.	Oil Bearing	1.686	1.685	1.664
7.	Other Farm	2.535	2.592	1.750
8.	Food Product	2.952	2.924	2.645
9.	Textile	2.525	2.540	2.588
10.	Lumber	2.331	2.331	2.272
11.	Furniture	2.264	2.269	2.218
12.	Paper	2.350	2.369	2.282
13.	Printing	1.942	1.955	1.991
14.	Chemicals	2.240	2.265	2.162
15.	Petroleum	2.498	2.401	2.307
16.	Plastic, rubber	2.108	2.121	2.071
17.	Leather	2.191	2.183	2.331
18.	Stone, Clay	1.896	1.880	1.962
19.	Primary Metal	2.215	2.464	2.371
20.	Fabricated Metal	2.225	2.221	2.210
21.	Machinery	2.087	2.096	2.055
22.	Electrical Equipment	2.097	2.063	2.059
23.	Motor Vehicle	2.619	2.555	2.380
24.	Miscellaneous Manufacturing	2.085	2.088	1.998
25.	Coal	1.777	1.747	1.762
26.	Petroleum and Natural Gas	1.617	1.612	1.573
27.	Other Minings	2.182	2.155	1.819
28.	Construction	2.071	2.070	2.066
29.	Transportation	1.651	1.660	1.730
30.	Trade	1.394	1.393	1.392
31.	Financial Service	1.430	1.430	1.437
32.	Communication	1.377	1.377	1.374
33.	Utility	1.919	1.917	1.909
34.	Commercial Service	1.787	1.786	1.772
35.	Government	1.120	1.120	1.120
	Total			

(Table 7.5)

Top Five Gainers in Value Added in 1978 (unit: thousand dollars)

The Waterway Counties		The Rest of Arkansas and Oklahoma		The Rest of U.S.	
Industry	Values Added	Industry	Values Added	Industry	Values Added
Chemicals	975	Grains	1,609	Chemicals	21,790
Plastic	888	Chemicals	1,082	Primary Metal	4,062
Primary Metal	861	Plastic	1,047	Commercial Service	3,541
Fabricated Metal	726	Other Farm	783	Other Mining	3,024
Oil Bearing	579	Petroleum	531	Utility Service	2,160
Regional* total	10,670	Regional total	7,747	Regional total	43,950

(Table 7.6)

Top Five Gainers in Wage Payment in 1978 (unit: thousand dollars)

The Waterway Counties		The Rest of Arkansas and Oklahoma		The Rest of U.S	
Industry	Wage	Industry	Wage	Industry	Wage
Other Mining	1,093	Plastic	661	Chemicals	12,230
Primary Metal	658	Chemicals	607	Primary Metal	3,105
Plastic	562	Other Farm	429	Commercial Service	2,414
Chemical	548	Primary Metal	308	Other Minings	1,524
Fabricated Metal	536	Stone, Clay	300	Transportation	971
Regional total	6,222	Regional total	3,628	Regional total	25,530

*Regional total means total of all 35 industries.

The chemical industry is the single largest gainer in value added. The chemical industry in the rest of the U.S. produced additional $21,790 thousand because of the Waterway. Primary metal ($4,062 thousand), commercial services ($3,541 thousand) "other minings" ($3,024 thousand), and utility services ($2,160 thousand) constitute the top five gainers in 1978. In the rest of Arkansas and Oklahoma, the most value added gainer is the grain industry which contributed additional $1,609 thousand for the economy. It was followed by chemicals, $1,082 thousand; plastic, $1,047 thousand; other farm, $738 thousand; and petroleum refinery, $531. In the waterway counties, the chemical industry increased its value added by $975 thousand because of the waterway and plastic primary metal fabricated metal, and oil bearing crop sector made the top gainer in the waterway counties in 1978.

The value added included wage payment, the payment for the capital service, interest and excise taxes. Since the labor intensity differs from one industry to another, wages are not proportional to the values added.

The "other minings" sector paid additional $1,093 thousand to its workers because of the waterway transportation. Primary metal industry paid $658 thousand to its workers, plastic industry, $562 thousand; chemical industry, $548 thousand. These wage payments were direct result of economic stimulation which the waterway has initated in 1978.

The plastic industry is the largest gainer in wage payment in the rest of Arkansas and Oklahoma in 1978. The plastic industry increased wage payment $661 thousand because the waterway. Chemical ($607 thousand), other farm ($429 thousand), primary metal ($308 thousand), and stone-clay ($300 thousand) are other major gainers in wage payment because of the waterway transportation.

As expected, the chemical industry in the rest of the U.S. paid $12,230 thousand for the additional labor services. The farmers purchased more

fertilizers because the waterway provided relatively inexpensive fertilizers.* To meet these expanded demands, the chemical industry employed more labors and paid more wages for their services. Because of similiar reasons primary metal increased its wage payment by $3,105 thousand, followed by commercial service ($2,414 thousand), "other mining" ($1,524 thousand), and transportation ($971 thousand). It is evident that the expanded market activities require more transportation services. Tables 7.5 and 7.6 provides those statistics.

(7.3) Employment Impacts

The waterway stimulates the industrial outputs which increase the employment. The increase in employment was estimated from the wage increase. For example, in 1978, the wage payment of other minings has increased by $1,093 thousand because of shipment of rocks, gravel, and sands in the waterway counties. Average wage in typical workers in other mining industry was $6.31 per hour in the waterway counties. The $1,093 thousand wage payment could employ approximately 173.2 thousand hours. A full time equivalent worker was assumed to work 2040 hours per year (51 week x 40 hours per week). Dividing 173.2 thousand hours by the full time equivalent 2040 hours, we obtain the employment statistics of the industry (85 jobs for the other minings in the waterway counties).

The total jobs created by the waterway are 1929 for the rest of the U.S., 454 for the waterway counties and 337 for the rest of Arkansas and Oklahoma in 1978. This is based on the medium estimate of transportation cost. This figure could be much higher if we use the high estimate of the transportation cost.

The largest employment impact in a single industry comes from the chemical industry in the rest of U.S. which created 855 more jobs because of the waterway

*It implies that the fertilizer price would have been higher if the waterway wasn't built.

transportation. The commercial service, primary metal, and other mining have gained their employment significantly. The waterway created 327 new jobs for commercial service, 186 for primary metal, and 118 for other minings in 1978.

In the waterway counties, the largest gains in employment were made in other mining (85 new jobs), followed by coal (64 jobs), plastic (50), fabricated metal (41), primary metal (39), and chemicals (38) in 1978. The major employment gainers in the non-water regions are other farms (67 new jobs) followed by rubber (59), chemicals (42), grains (33), lumber (24), and stone-clay (23). Table 7.7 provides the detail of the employment statistics.

(7.4) Equilibrium Price Impact

A supplier will supply a larger quantity of goods and services when its sales price is increased. Conversely, the purchaser of such goods and services will buy more when the price is lowered. Because of this conflicting desire, any arbitrary price could not clear the market; i.e., the quantity demanded by buyers may not equal to the quantity which the supplier is willing to provide. However, there is one price level which makes the demand and supply equal. This price is called the "equilibrium price."

Under MRVIO model, both demand and supply of each of the 35 commodities in each region are endogenously determined. There is only one set of prices which will equate all demands and all supplies of the commodities. These equilibrium prices are determined by the price frontier equations as discussed in chapter 3.

The Arkansas waterway system reduces these equilibrium prices of all commodities in all regions because the commodities are shipped at lower costs with the waterway.

Which is the region and what are the industries most affected by the waterway?

The model estimates that the waterway reduces equilibrium prices of farm, manufacturing, and mining products produced in both the waterway counties and

the rest of the Arkansas and Oklahoma. Equilibrium prices in the chemical industry which was directly benefited by its shipment on the waterway were reduced by 0.7988 percent in the rest of Arkansas and Oklahoma and 0.6975 percent in the waterway counties in 1978.

(Table 7.7)

Number of Jobs Created by the Waterway in 1978[1]

Top Ten Industries					
The Waterway Counties		The Rest of Arkansas and Oklahoma		The Rest of U.S.	
Industry	Jobs	Industry	Jobs	Industry	Jobs
Other Mining	85	Other Farms	67	Chemicals	855
Coal	64	Plastic	59	Commercial Service	327
Plastic	50	Chemicals	42	Primary Metal	186
Fabricated Metal	41	Grains	33	Other Mining	118
Primary Metal	39	Lumber	24	Transportation	61
Chemicals	38	Stone, Clay	23	Utility Service	38
Stone, Clay	30	Primary Metal	18	Food Processing	38
Paper	20	Paper	13	Fabricated Metal	36
Other Farms	14	Textile	12	Machinery	35
Machinery	13	Other Mining	10	Construction	34
Total of all 35 industries	454	Total of all 35 industries	337	Total of all 35 industries	1,929

[1]Full time equivalent (2040 hours per year)

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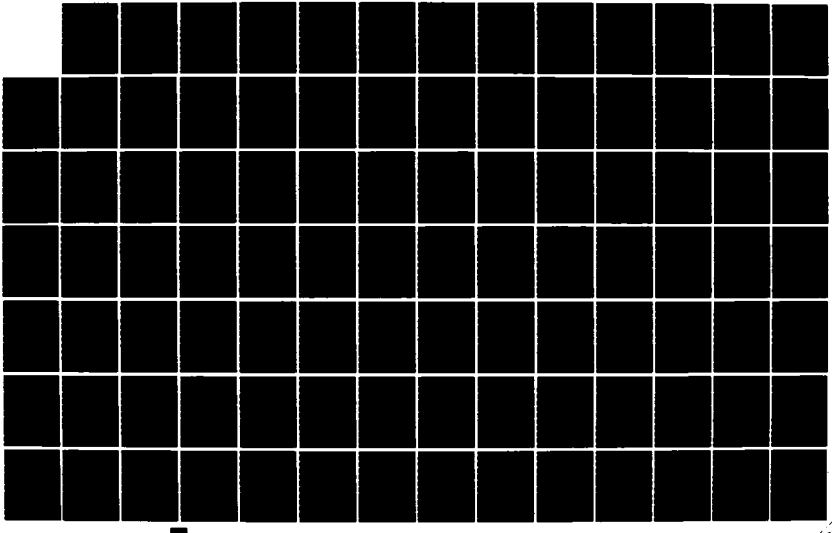

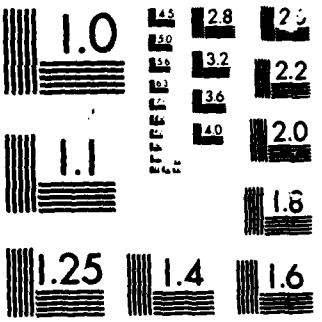

Number of Jobs Created by the Waterway
(1974-1978)

Regions	1974	1975	1976	1977	1978
The Waterway Counties	560(5.56)*	555(6.05)	496(5.80)	500(6.40)	454(6.22)
The Rest of Arkansas and Oklahoma	478(3.85)	354(3.09)	320(2.96)	320(3.16)	337(3.63)
The Rest of U.S.	2123(20.44)	1795(18.69)	1671(18.83)	1757(21.45)	1929(25.53)

The figures inside the parenthesis is total wage payment in million dollars.
The lower wage rate in 1974 could hire more employment than in 1978.

The equilibrium prices for the "other farm" sector increase 0.6818 percent lower in the water regiona and 0.6414 percent lower in the rest of Arkansas and Oklahoma. Equilibrium prices were lowered by somewhere between 0.16 percent and 0.59 percent in the cotton, grains, oil bearing, dairy farm, poultry and egg sectors. Equilibrium price reductions were noted in chemical industry, rubber, primary fabricated metal, and miscellaneous manufacturing. The other way of saying this is that the equilibrium prices would have to be raised in the absence of the waterway.

Chemical, primary metal (iron & steel), fabricated metal, petroleum, coals, and grains are the industries which were directly benefited by the shipment of their products by the waterway. The dairy farm, poultry and eggs which purchase a lot of grains are affected because they purchase grain for feed. In the waterway counties, the dairy farm purchases an average of 34.34 cent grain to produce one dollar output. The poultry and egg industry spends 16.37 cent for the purchase of grains to produce $1 worth of its product. Grain farmers, cotton and plastic industries save their costs because chemical inputs are relatively inexpensive. The cotton farmer purchases 15.04 cents of chemical fertilizer to produce one dollar worth of cotton. Plastic industry spent almost 20 percent of its sales for the purchase of chemical input.

(Table 7.8)

The Percentage Decrease in Equilibrium Prices Because of the Waterway Transportation in 1978 (Unit: Percent)

Commodities	The Waterway Counties	The Rest of Arkansas and Oklahoma	The Rest of the U.S.
(A) Agriculture			
1. Dairy Farm	0.1586	0.1625	0.0054
2. Poultry and Egg	0.1777	0.1752	0.0060
3. Meat Animal	0.0987	0.0965	0.0085
4. Cotton	0.5739	0.5876	0.0032
5. Grain	0.4158	0.3716	0.0024
6. Oil Bearing Crops	0.1902	0.1953	0.0029
7. Other Farm Products	0.6414	0.6816	0.0016
(B) Manufacturing			
8. Food & Kindred	0.0847	0.0819	0.0060
9. Apparel & Textile	0.1237	0.1491	0.0046
10. Lumber & Wood	0.1420	0.1362	0.0023
11. Furniture	0.0960	0.0758	0.0028
12. Paper	0.1670	0.1734	0.0034
13. Printing	0.0576	0.0588	0.0017
14. Chemical	0.6975	0.7988	0.0033
15. Petroleum Refineries	0.1815	0.1710	0.0026
16. Plastic	0.5850	0.6078	0.0032
17. Leather	0.0614	0.05494	0.0031
18. Stone, Clay	0.2939	0.2504	0.0034
19. Primary Metal	0.2784	0.2799	0.0051
20. Fabricated Metal	0.2162	0.0836	0.0029
21. Machinery	0.0984	0.0403	0.0021
22. Electrical Equipment	0.0863	0.0572	0.0021
23. Motor Vehicle	0.1546	0.0652	0.0026

Commodities	The Water-way Counties	The Rest of Arkansas and Oklahoma	The Rest of the U.S.
24. Miscell. Mfg.	0.1636	0.1050	0.0021
(C) Mining			
25. Bituminous Coal	0.0552	0.0480	0.0064
26. Crude Petroleum & Natural Gas	0.0370	0.0341	0.0006
27. Other Mining	0.2493	0.2060	0.0028
(D) Service			
28. Contract Construction	0.1254	0.1062	0.0022
29. Transportation	0.0281	0.0299	0.0010
30. Trade	0.0126	0.0131	0.0005
31. Financial Service	0.0104	0.0106	0.0003
32. Communication	0.0111	0.0108	0.0004
33. Electric, Gas Service	0.0405	0.0413	0.0004
34. Motel	0.0481	0.0491	0.0001
(E)			
35. Government	0.0101	0.0103	0.0003

The equilibrium price effect on commodities produced by the rest of the U.S. is very small because the Waterway shipped very small amounts of products produced by the rest of the U.S., relative to their total output.

The equilibrium price is a convenient mechanism for tracing price level impacts due to changes in costs. The observed price may not be same as the equilibrium price. However, the observed price moves in the same direction with the equilibrium price. The equilibrium price provides interesting insight to evaluate the industry's cost reduction. Table 7.8 provides a complete list of the percentage change in equilibrium prices because of the waterway transportation in 1978.

(7.5) Structural Impact

An interesting feature of the MRVIO model is its ability to respond to the input substitution behavior of firms, a property not shared by other conventional input-output models. The waterway lowers the equilibrium prices of all commodities produced in all regions as discussed in the previous section. The lowered equilibrium prices make firms to substitute lesser expensive inputs for expensive ones. For example, chemical fertilizers, grains, other farm products, petroleum, plastic, primary metal, and other mining products became relatively lesser expensive because of their shipment by the waterway. The industrial demand for these inputs is increased with the waterway transportation and by doing so, the technical coefficient has changed.

Cotton, grains, oil bearing crop and other farm industries employ more chemical fertilizers. The estimated chemical input coefficients have increased 2.06 percent for cotton, 2.22 percent for grain, 2.44 percent for oil bearing and 2.0 percent for other farm. Livestock industry also consumes more chemical products. Their chemical input coefficients are up 2.47 percent for dairy farm, 2.45 percent for poultry and eggs, and 2.53 percent for meat animal.

Food processing idustry consumes more grains, poultry and eggs, oil bearing, and other farm products because these items become relatively inexpensive because of the waterway transportation.

The input coefficients for the food processing have changed; the grain input coefficient for the food processing was up by 0.173 percent; poultry and egg input coefficient by 0.416 percent; oil bearing input coefficient by 0.0731 percent.

Table 7.9 provides the percentage change in technical coefficients in 1978 for selected inputs.

Waterway transportation brings two important structural changes. One is a result of firms' optimizing behavior of input mix within the industry i.e., purchase more portion of inexpensive input and lesser portion of expensive inputs). Another is a result of changes in industrial mix. The industrial mix impact of the waterway differs from one industry to another. Some industries gain their strength and some industries lose their relative industrial shares. Chemical, petroleumn, primary metal, other mining, service, utility service, grains, food processing, and other farm are strong industrial gainers because of the waterway transportation. Relative losers are furniture and fixture industries which have relatively lesser industrial gains because of the waterway transportation.

(7.6) Impact on Regional Trade Structure

Each firm purchases its inputs and sells its output so that the firm could get the maximum possible profit. Transportation cost is a part of such business cost which affects the profit maximizing decision. The waterway lowers the transportation cost of chemicals, coal, petroleum, primary metal, grains, and other mineral products. How would the transportation cost affect the regional trade structure?

(Table 7.9)

Percentage Change in Technical Coefficients for Selected Inputs in 1978 (Unit: Percent)

Input	Industry			
The Waterway Counties	Meat Animals	Food Processing	Gas and Oil	Service
Grains	0.159	0.173	-	0.210
Chemical	2.530	2.544	2.591	2.580
Petroleum	0.305	0.319	0.366	0.355
Primary Metal	0.428	0.442	0.489	0.478
The Rest of Arkansas and Oklahoma				
Grains	0.153	0.167	-	0.200
Chemicals	2.631	2.645	2.691	2.677
Petroleum	0.333	0.348	0.395	0.381
Primary Metal	-0.021	-0.004	0.042	0.027
The Rest of the U.S.				
Grains	0.007	0.010	-	0.015
Chemicals	0.000	0.002	0.007	0.007
Petroleum	0.001	0.003	0.009	0.008
Primary metal	-0.001	0.001	0.006	0.006

The transportation cost affects the equilibrium prices of all commodities in all regions. These changes in equilibrium prices result in reformulation of industry's marketing strategies. Industries tend to purchase their inputs from the regions where the equilibrium price plus unit transportation cost is the least expensive. The waterway lowered the equilibrium prices of commodities produced by the waterway counties and the rest of Arkansas and Oklahoma. Because of these price effects, the waterway stimulated the purchase of all commodities produced by the waterway counties and by the rest of Arkansas and Oklahoma. If the waterway wasn't built, the percent of the commodity purchased from the waterway counties and the percent from the rest of Arkansas and Oklahoma could have been smaller than we observe now. That implies that the relative portion of the commodity purchased from the rest of the U.S. would have been more than we observe now if the waterway wasn't built.

Table 7.10 shows the impact of the waterway on grain trade coefficient among three regions in 1978. The trade coefficient denotes the percent of commodity shipped between each set of regions.

The waterway counties consumes 17.1 percent of its grain from its local production, 50.2 percent from the rest of Arkansas and Oklahoma, and 32.7 percent from the rest of U.S. If the waterway wasn't built, the lesser grain would have been produced by the waterway counties and the rest of Arkansas and Oklahoma. The local grain growers would have to pay more expensive fertilizer and its equilibrium price of grains would have been more expensive if the waterway wasn't built. Because of these reasons, the region's consumption of grain from the waterway counties would have been 0.157 percent smaller and its consumption from the rest of Arkansas and Oklahoma would have been 0.113 percent lesser than the trade coefficients with the waterway.

In general, without the waterway the water region and the non-water region would have produced the industrial outputs at higher cost. Because of this

(Table 7.10)

Trade Coefficients of Industry Groups
Between Regions in MRVIO Model
McClellan-Kerr Arkansas River Navigation (Unit: Percent)

	Trade Coefficients			Percentage change in trade Coefficients with and without waterway		
TO:	The Waterway Counties	Rest of Arkansas and Oklahoma	Rest of U.S.	The Waterway Counties	Rest of Arkansas and Oklahoma	Rest of U.S.
FROM						
Grain						
Waterway Counties	17.104 (17.077)	9.075 (9.060)	0.495 (0.492)	-0.157	-0.166	-0.817
Rest of Arkansas and Okla.	50.202 (50.145)	56.852 (56.783)	2.009 (2.000)	-0.113	-0.122	-0.458
Rest of U.S.	32.693 (32.777)	34.073 (34.157)	97.495 (97.508)	0.256	0.248	0.014

Note: The figures inside the parenthesis are trade coefficients which would have been if the waterway wasn't built. For example, the waterway counties imported grain from the rest of Arkansas and Oklahoma 50.202 percent of its consumption. If the waterway wasn't built, it would import only 50.145 percent of its consumption, a -0.113 percent = (100*(50.145 - 50.202)/50.145).

cost disadvantage as compared to the product produced by the rest of the U.S., the waterway counties and the rest of Arkansas and Oklahoma would have produced smaller quantity. The amount of trade among all three regions would be smaller than the case with the waterway. However, the industries in the waterway counties and in the rest of Arkansas and Oklahoma would have purchased more of their inputs from the rest of the U.S. because the local producers' cost of production is still more expensive as compared to the price of the product produced by the rest of the U.S.

Table 7.11 shows the percentage change in trade coefficients from the rest of U.S.

(Table 7.11)

Change in Regional Imports from
The Rest of the U.S. if the Waterway wasn't Built (Unit: Percent)

	Industry	The Waterway Counties	The Rest of Arkansas and Oklahoma	The Rest of the U.S.
1.	Dairy Farm	0.060	0.056	0.004
2.	Poultry, Eggs	0.120	0.118	0.016
3.	Meat Animal	0.031	0.030	0.002
4.	Cotton	0.532	0.529	0.066
5.	Grains	0.256	0.248	0.014
6.	Oil Crops	0.155	0.155	0.028
7.	Misc. Agriculture	0.000	0.000	0.000
8.	Food and Kindred	0.041	0.036	0.001
9.	Textile	0.045	0.037	0.001
10.	Lumber	0.119	0.099	0.002
11.	Furniture	0.016	0.016	0.002
12.	Paper	0.035	0.031	0.004
13.	Printing	0.050	0.051	0.000
14.	Chemicals	-0.341	-0.241	0.004
15.	Petroleum Refinery	0.402	-0.338	0.007
16.	Plastic, Rubber	0.173	0.171	0.011
17.	Leather	0.009	0.009	0.001
18.	Stone, Clay	0.161	0.171	0.002
19.	Primary Metal	0.022	0.049	0.002
20.	Fabricated Metal	0.086	0.088	0.001
21.	Machinery	0.023	0.022	0.001
22.	Electrical Equipment	0.021	0.015	0.001
23.	Vehicle Equipment	0.023	0.031	0.001
24.	Misc. Manufacturing	0.042	0.041	0.001
25.	Coal	0.010	0.008	0.035
26.	Crude Petroleum & Gas	0.028	0.028	0.001
27.	Other Mining	3.299	-4.320	0.021
28.	Construction	0.0	0.0	0.0
29.	Transportation	0.0	0.0	0.0
30.	Trade	0.0	0.0	0.0
31.	Finance	0.007	0.007	0.0
32.	Communication	0.0	0.0	0.0
33.	Electric, Gas Service	0.0	0.0	0.0
34.	Hotel	0.028	0.030	0.0
35.	Government	0.0	0.0	0.0

Summary

Our empirical findings of the impact of the waterway are summarized in the Table 7.12; the impact was measured by output, employment, tax revenue, and government receipts. The estimates were based on actual transportation cost reductions accruing to shippers who actually used the waterway in 1978. Not included are the effect which would accrue to rail industries by other modes. The rest of the U.S. increased its industrial output by $102 million and its regional gross product by $43.95 million. The number of jobs created by the waterway were 1,929 in year 1978. The waterway counties and the rest of Arkansas and Oklahoma both enjoyed economic growth because of the waterway. Regional gross output has increased by $10.67 million in the waterway counties and $7.75 million in the rest of Arkansas and Oklahoma solely due to the waterway. More jobs were created. 454 full time equivalent jobs were created in 1978 because of the waterway transportation in the waterway counties and 337 jobs in the rest of Arkansas and Oklahoma.

(Table 7.12)

Summary of Impacts from MRVIO Model
McClellan-Kerr Arkansas River Navigation System
- 1978* -

	Total U.S.	The Waterway Counties	The Rest of Arkansas and Oklahoma	The Rest of the U.S.
1. Output ($ Million)	154.36	27.54	24.82	102.00
2. Employment (Jobs)**	2720	454	337	1929
3. Regional Gross Output ($ Million)	62.37	10.67	7.75	43.95
4. Exercise Tax ($ Thousand)	3,496.3	506.9	486.4	2,503.0
5. Federal Income ($ Thousand)	5,086.9	907.3	817.0	3,362.6

* Based on the medium estimate of the transportation cost savings.
** Full-time equivalent.

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APPENDIX I

Empirical Results of the Phase II Study

APPENDIX I: EMPIRICAL RESULTS

TABLE 1
Technical Coefficients in 1972

1. WATER COUNTIES (TECHNICAL COEFFICIENT)

FOR YEAR 1972

	1	2	3	4	5	6	7	8	9	10
1	0.0	0.0	0.002964	0.000230	0.008729	0.001162	0.000122	0.051682	0.0	0.0
2	0.0	0.0	0.0	0.000713	0.002505	0.001449	0.000268	0.027736	0.0	0.0
3	0.0	0.0	0.344472	0.011891	0.045761	0.014421	0.004575	0.226025	0.001397	0.0
4	0.0	0.0	0.0	0.012673	0.0	0.0	0.0	0.002724	0.010549	0.0
5	0.343545	0.163751	0.227208	0.0	0.044185	0.0	0.0	0.015376	0.0	0.0
6	0.0	0.0	0.000142	0.0	0.0	0.056000	0.0	0.025336	0.0	0.0
7	0.035042	0.125310	0.015520	0.186853	0.026350	0.021211	0.159561	0.020104	0.001828	0.099368
8	0.192344	0.418908	0.072506	0.000046	0.000029	0.000034	0.000073	0.185704	0.001277	0.000218
9	0.002217	0.000041	0.000025	0.0	0.003963	0.000034	0.005865	0.000755	0.447747	0.001479
10	0.000498	0.000122	0.000099	0.000092	0.000147	0.000135	0.032973	0.000542	0.000442	0.272896
11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.000089
12	0.000224	0.015970	0.000031	0.0	0.000199	0.000017	0.005305	0.029774	0.006798	0.005095
13	0.000274	0.000234	0.000186	0.000230	0.000280	0.000202	0.000462	0.005446	0.000469	0.000184
14	0.009389	0.006473	0.002308	0.152238	0.121512	0.053776	0.180318	0.007597	0.031686	0.008630
15	0.006575	0.005686	0.003608	0.022793	0.042004	0.022356	0.037183	0.002528	0.001855	0.014260
16	0.005454	0.002095	0.002958	0.006348	0.008508	0.005745	0.011583	0.010640	0.003208	0.004976
17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.000009	0.003421	0.000177
18	0.000523	0.0	0.0	0.000092	0.000250	0.000017	0.001703	0.014127	0.001735	0.011002
19	0.000174	0.000193	0.000136	0.000092	0.000214	0.000185	0.000122	0.000370	0.000147	0.004805
20	0.003935	0.001149	0.001033	0.001150	0.002895	0.001129	0.002312	0.029375	0.000857	0.042507
21	0.007247	0.003082	0.004072	0.010028	0.013208	0.009485	0.011413	0.001641	0.003377	0.007893
22	0.000549	0.000264	0.000291	0.001012	0.001429	0.000994	0.001095	0.000071	0.000535	0.001132
23	0.000872	0.000285	0.000415	0.000667	0.000648	0.000539	0.000681	0.000136	0.000049	0.002202
24	0.000100	0.000102	0.000093	0.000092	0.000125	0.000118	0.000170	0.000216	0.011844	0.001145
25	0.0	0.0	0.0	0.0	0.0	0.0	0.000219	0.000210	0.000273	0.001990
26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
27	0.000100	0.0	0.0	0.003519	0.007831	0.001348	0.004186	0.000121	0.000016	0.0
28	0.009464	0.004923	0.004610	0.008694	0.013385	0.008255	0.012970	0.001862	0.001140	0.002549
29	0.051330	0.017394	0.009146	0.014375	0.023499	0.007110	0.027571	0.027058	0.014839	0.030108
30	0.021107	0.055224	0.031559	0.038640	0.050520	0.020200	0.125833	0.045348	0.037572	0.040721
31	0.061865	0.025318	0.034202	0.194535	0.191340	0.123644	0.085365	0.009476	0.013906	0.014349
32	0.003711	0.002726	0.002556	0.002622	0.003698	0.002679	0.005183	0.001760	0.003666	0.001902
33	0.011307	0.008931	0.007766	0.013846	0.013076	0.001162	0.012070	0.007542	0.007425	0.009557
34	0.014545	0.034239	0.009691	0.019251	0.027197	0.019172	0.027887	0.033595	0.028980	0.028615
35	0.000174	0.000142	0.000136	0.000138	0.000192	0.000152	0.000268	0.001168	0.002128	0.000941
36	0.207437	0.105434	0.222270	0.297139	0.346318	0.627070	0.242663	0.213948	0.352837	0.392218
37	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000

TABLE 1 (continued)

1. WATER COUNTIES (TECHNICAL COEFFICIENT)

FOR YEAR 1972

	11	12	13	14	15	16	17	18	19	20
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	0.0	0.0	0.0	0.000127	0.0	0.0	0.0	0.0	0.0	0.0
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.000005	0.0	0.0
5	0.0	0.000690	0.0	0.000457	0.0	0.0	0.0	0.0	0.0	0.0
6	0.0	0.0	0.0	0.000584	0.0	0.0	0.0	0.0	0.0	0.0
7	0.000378	0.000344	0.000205	0.001524	0.000077	0.000321	0.0	0.000514	0.000252	0.000518
8	0.003686	0.005991	0.000679	0.012598	0.001406	0.000383	0.001493	0.000454	0.000549	0.000339
9	0.060303	0.010864	0.001707	0.000406	0.000297	0.050364	0.180934	0.000702	0.000864	0.001679
10	0.125300	0.061309	0.0	0.000178	0.000317	0.003594	0.001875	0.008342	0.004875	0.004702
11	0.007643	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.000237	0.0
12	0.017472	0.280190	0.150190	0.019151	0.006071	0.024737	0.022226	0.016455	0.002321	0.008578
13	0.001282	0.000779	0.085179	0.002794	0.000119	0.000634	0.000625	0.000532	0.000779	0.003031
14	0.011739	0.044138	0.014653	0.230138	0.033423	0.198641	0.011842	0.020548	0.013312	0.016872
15	0.002787	0.010426	0.001879	0.009093	0.085687	0.002981	0.002084	0.007328	0.004367	0.003267
16	0.058136	0.011499	0.004658	0.022072	0.002260	0.046136	0.075777	0.016739	0.001998	0.011675
17	0.001695	0.000045	0.000113	0.000178	0.000032	0.000106	0.094496	0.000018	0.000044	0.000010
18	0.012531	0.001577	0.000732	0.006756	0.002715	0.007042	0.000035	0.124683	0.009653	0.007449
19	0.039003	0.002496	0.001298	0.011125	0.002090	0.008464	0.000035	0.005768	0.210660	0.289311
20	0.057703	0.005415	0.001222	0.021995	0.011819	0.017854	0.009342	0.010760	0.011033	0.058123
21	0.002580	0.006317	0.003517	0.010845	0.001824	0.010288	0.001250	0.005594	0.065306	0.024391
22	0.000649	0.000096	0.000183	0.000483	0.000124	0.001185	0.000556	0.001500	0.015700	0.005922
23	0.000128	0.000049	0.000108	0.000051	0.000077	0.001171	0.0	0.000257	0.000437	0.001128
24	0.004026	0.001583	0.009747	0.001956	0.000797	0.003004	0.005869	0.002684	0.003170	0.002580
25	0.000454	0.004611	0.000011	0.003302	0.001335	0.000506	0.0	0.003162	0.011711	0.000306
26	0.0	0.0	0.0	0.001600	0.531243	0.0	0.0	0.0	0.0	0.0
27	0.0	0.003673	0.0	0.013461	0.004830	0.001726	0.0	0.051691	0.029643	0.000553
28	0.002234	0.009021	0.003608	0.008204	0.019277	0.005417	0.001285	0.005988	0.014762	0.003215
29	0.030610	0.054089	0.032010	0.039927	0.063600	0.038896	0.011078	0.078370	0.049517	0.026578
30	0.052629	0.041165	0.026463	0.030555	0.010643	0.028172	0.033443	0.025885	0.055222	0.033045
31	0.022493	0.020805	0.043998	0.033882	0.017771	0.018131	0.016843	0.019809	0.013172	0.020796
32	0.003436	0.002963	0.011099	0.004038	0.002056	0.004157	0.003299	0.003258	0.004070	0.003491
33	0.007866	0.024763	0.005005	0.030834	0.022863	0.016268	0.004063	0.026054	0.038265	0.010967
34	0.040933	0.037526	0.078303	0.104135	0.028250	0.047827	0.062476	0.036966	0.035678	0.034179
35	0.001431	0.001907	0.013458	0.002311	0.001305	0.001053	0.005348	0.001133	0.001753	0.001103
36	0.400680	0.355368	0.508474	0.375241	0.147690	0.460941	0.453725	0.524797	0.400649	0.426193
37	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000

TABLE 1 (continued)

1. WATER COUNTIES (TECHNICAL COEFFICIENT)

FOR YEAR 1972

CTT	21	22	23	24	25	26	27	28	29	30
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.000038	0.0
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	0.0	0.0	0.0	0.000061	0.0	0.0	0.0	0.0	0.0	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.000137	0.0	0.0
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	0.000115	0.000178	0.000098	0.001636	0.0	0.000022	0.0	0.001451	0.000098	0.000558
8	0.000690	0.000725	0.000348	0.003097	0.000043	0.000295	0.000252	0.000299	0.001892	0.000651
9	0.001481	0.001475	0.013346	0.017363	0.002861	0.000125	0.001174	0.004842	0.001580	0.000666
10	0.002670	0.002248	0.012657	0.021741	0.007088	0.0	0.0	0.058609	0.000110	0.000163
11	0.000010	0.007888	0.003230	0.0	0.0	0.0	0.0	0.002552	0.0	0.0
12	0.004305	0.007993	0.004800	0.031851	0.002519	0.000110	0.006834	0.002667	0.001485	0.007008
13	0.000773	0.001616	0.000698	0.001042	0.000171	0.000125	0.000629	0.000213	0.001650	0.001861
14	0.005178	0.009424	0.008919	0.037844	0.010503	0.006998	0.022013	0.012464	0.001127	0.000537
15	0.005178	0.002228	0.002585	0.006141	0.014816	0.003941	0.047841	0.018884	0.033498	0.007153
16	0.015386	0.017362	0.022931	0.029204	0.008924	0.000265	0.015681	0.009118	0.008465	0.002177
17	0.000056	0.000053	0.000037	0.002591	0.0	0.000037	0.0	0.000026	0.000023	0.000068
18	0.005037	0.007518	0.015664	0.007192	0.004996	0.000479	0.001132	0.064555	0.000269	0.000335
19	0.125952	0.080375	0.194618	0.069433	0.012894	0.007057	0.042642	0.032547	0.000844	0.000023
20	0.036664	0.035646	0.083053	0.026613	0.016396	0.005923	0.018029	0.093699	0.001410	0.000283
21	0.135155	0.016220	0.046080	0.006921	0.055079	0.018799	0.102935	0.021722	0.002265	0.000886
22	0.053240	0.205674	0.027292	0.027873	0.002861	0.007912	0.003480	0.024682	0.002502	0.000379
23	0.000053	0.000085	0.159464	0.000209	0.000213	0.000317	0.010147	0.000337	0.014462	0.000378
24	0.005106	0.005250	0.003605	0.062882	0.000939	0.000877	0.002055	0.005317	0.000870	0.000677
25	0.000216	0.000092	0.000533	0.000366	0.123949	0.0	0.001132	0.0	0.000009	0.0
26	0.0	0.0	0.0	0.0	0.0	0.035875	0.0	0.0	0.000211	0.0
27	0.000069	0.000062	0.0	0.000022	0.000299	0.000052	0.033459	0.008486	0.0	0.0
28	0.002665	0.002430	0.002708	0.003781	0.008539	0.044199	0.010860	0.000284	0.004302	0.004003
29	0.014932	0.014178	0.021623	0.022928	0.009991	0.006483	0.019245	0.025661	0.127733	0.012786
30	0.036662	0.028367	0.054304	0.040517	0.031510	0.005554	0.048302	0.077165	0.030019	0.013961
31	0.022235	0.019411	0.009505	0.027634	0.049101	0.169989	0.083774	0.012402	0.038400	0.055247
32	0.005248	0.005678	0.002512	0.006503	0.000982	0.002792	0.001719	0.002884	0.013936	0.014186
33	0.007800	0.007187	0.008147	0.007384	0.020751	0.014158	0.059287	0.001323	0.003943	0.015211
34	0.039278	0.062459	0.050532	0.074370	0.034157	0.032766	0.080294	0.058828	0.074400	0.087765
35	0.001417	0.002040	0.001815	0.002717	0.000654	0.001017	0.002348	0.000367	0.002944	0.005409
36	0.467428	0.456119	0.248898	0.460085	0.579565	0.633834	0.384738	0.458480	0.631518	0.767630
37	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000

TABLE 1 (continued)

1. WATER COUNTIES (TECHNICAL COEFFICIENT)

FOR YEAR 1972

	31	32	33	34	35
1	0.0	0.0	0.0	0.0	0.0
2	0.0	0.0	0.0	0.001179	0.0
3	0.0	0.0	0.0	0.000199	0.0
4	0.0	0.0	0.0	0.0	0.000106
5	0.000017	0.0	0.0	0.001307	0.000768
6	0.0	0.0	0.0	0.0	0.000314
7	0.000975	0.002606	0.001743	0.004231	0.000112
8	0.000448	0.000269	0.000142	0.062535	0.000375
9	0.000224	0.000415	0.000201	0.004798	0.000452
10	0.000002	0.0	0.0	0.000234	0.0
11	0.0	0.0	0.0	0.0	0.0
12	0.001687	0.000759	0.000521	0.004582	0.000259
13	0.006222	0.003198	0.001383	0.006195	0.000716
14	0.000127	0.000025	0.002351	0.010661	0.002047
15	0.002876	0.000511	0.027330	0.005098	0.001990
16	0.000687	0.000287	0.000985	0.006212	0.000245
17	0.000047	0.000032	0.000015	0.000687	0.000019
18	0.000025	0.000032	0.000102	0.002494	0.000093
19	0.000005	0.000550	0.000309	0.000163	0.000057
20	0.000025	0.0	0.000108	0.004355	0.000208
21	0.000197	0.000110	0.002548	0.007578	0.000406
22	0.000286	0.020952	0.002112	0.005241	0.000445
23	0.000116	0.000422	0.000241	0.022273	0.000594
24	0.000701	0.000983	0.000682	0.011359	0.000179
25	0.000008	0.0	0.046046	0.000107	0.002048
26	0.0	0.0	0.073529	0.0	0.0
27	0.0	0.0	0.0	0.0	0.000028
28	0.026217	0.028022	0.035718	0.009780	0.017754
29	0.002717	0.004105	0.009419	0.013511	0.008796
30	0.004116	0.002287	0.008475	0.027360	0.001225
31	0.140480	0.037207	0.020718	0.064597	0.004756
32	0.003960	0.015985	0.004291	0.011042	0.000823
33	0.007483	0.007764	0.227046	0.013968	0.011322
34	0.053508	0.082810	0.026339	0.094500	0.006921
35	0.007872	0.004729	0.003514	0.005913	0.000335
36	0.732985	0.785981	0.504130	0.597842	0.936618
37	1.000000	1.000000	1.000000	1.000000	1.000000

TABLE 1 (continued)

THE REST OF ARKANSAS AND OKLAHOMA (TRADE COEFFICIENT)

FOR YEAR 1972

	1	2	3	4	5	6	7	8	9	10
1	0.0	0.0	0.002973	0.000241	0.007643	0.001167	0.000143	0.056780	0.0	0.0
2	0.0	0.0	0.0	0.000715	0.002188	0.001439	0.000281	0.025496	0.0	0.0
3	0.0	0.0	0.345695	0.011897	0.040033	0.014419	0.004762	0.207776	0.000751	0.0
4	0.0	0.0	0.0	0.012659	0.0	0.0	0.0	0.002474	0.013112	0.0
5	0.360144	0.163940	0.228017	0.0	0.038652	0.0	0.0	0.019367	0.0	0.0
6	0.0	0.0	0.000145	0.0	0.0	0.056005	0.0	0.016496	0.0	0.0
7	0.036749	0.125451	0.015576	0.186815	0.023050	0.021216	0.165719	0.017967	0.001861	0.098511
8	0.231618	0.419385	0.072757	0.000052	0.000028	0.000041	0.000084	0.197360	0.001088	0.000219
9	0.002318	0.000048	0.000026	0.0	0.003465	0.000041	0.006094	0.000849	0.446323	0.001477
10	0.000517	0.000120	0.000099	0.000095	0.000131	0.000126	0.034241	0.000472	0.000601	0.273417
11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.000092
12	0.000231	0.015993	0.000034	0.0	0.000173	0.000024	0.005502	0.029196	0.008709	0.005096
13	0.000271	0.000239	0.000166	0.000241	0.000242	0.000207	0.000484	0.005479	0.000585	0.000185
14	0.009838	0.008486	0.002320	0.152223	0.106297	0.053769	0.187288	0.007570	0.041775	0.008652
15	0.006885	0.005689	0.003620	0.022790	0.036746	0.022366	0.038608	0.002517	0.001927	0.014280
16	0.005694	0.002102	0.002970	0.006353	0.007442	0.005728	0.012045	0.010633	0.005964	0.004961
17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.000008	0.003900	0.000181
18	0.000556	0.0	0.000002	0.000095	0.000214	0.000024	0.001786	0.013921	0.001076	0.011130
19	0.000172	0.000189	0.000137	0.000095	0.000186	0.000187	0.000143	0.000379	0.000177	0.004812
20	0.004148	0.001148	0.001036	0.001146	0.002533	0.001126	0.002378	0.033560	0.000685	0.042604
21	0.007614	0.003065	0.004086	0.010032	0.011556	0.009484	0.011848	0.001770	0.003111	0.007924
22	0.000576	0.000263	0.000291	0.001004	0.001251	0.001000	0.001135	0.000069	0.000705	0.001132
23	0.000901	0.000287	0.000418	0.000672	0.000565	0.000541	0.000711	0.000130	0.000050	0.002208
24	0.000113	0.000096	0.000095	0.000095	0.000110	0.000106	0.000173	0.000239	0.012234	0.001148
25	0.0	0.0	0.0	0.0	0.0	0.0	0.000227	0.000201	0.000187	0.001993
26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
27	0.000094	0.0	0.0	0.003536	0.006847	0.001358	0.004367	0.000115	0.000007	0.0
28	0.009917	0.004923	0.004631	0.006697	0.011709	0.008252	0.013462	0.001880	0.001054	0.002557
29	0.053802	0.017427	0.009174	0.014382	0.020558	0.007110	0.028631	0.026276	0.014295	0.030182
30	0.032605	0.055292	0.031671	0.038655	0.044196	0.020195	0.130708	0.044952	0.037791	0.040870
31	0.064850	0.025340	0.034318	0.194508	0.167391	0.123843	0.088670	0.009203	0.014860	0.014352
32	0.003873	0.002723	0.002565	0.002627	0.003236	0.002691	0.005384	0.001743	0.003848	0.001914
33	0.011851	0.009941	0.007799	0.013857	0.011439	0.001167	0.012529	0.007422	0.007236	0.009590
34	0.015252	0.034281	0.009727	0.019254	0.023796	0.019175	0.028942	0.033688	0.029344	0.028723
35	0.000192	0.000143	0.000133	0.000147	0.000164	0.000146	0.000281	0.001119	0.002132	0.000942
36	0.169225	0.104410	0.219500	0.297117	0.428160	0.627047	0.213373	0.222891	0.344670	0.390847
37	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.00000

TABLE 1 (continued)

THE REST OF ARKANSAS AND OKLAHOMA (TECHNICAL COEFFICIENT)

FOR YEAR 1972

	11	12	13	14	15	16	17	18	19	20
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	0.C	0.C	0.0	0.000183	0.0	0.0	0.0	0.0	0.0	0.0
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	0.0	0.000834	0.0	0.000587	0.0	0.0	0.0	0.0	0.0	0.0
6	0.0	0.0	0.0	0.000077	0.0	0.0	0.0	0.0	0.0	0.0
7	0.000408	0.000374	0.000201	0.000580	0.000069	0.000330	0.0	0.000382	0.000385	0.000506
8	0.003924	0.005997	0.000681	0.006331	0.001466	0.000387	0.013801	0.000343	0.000283	0.000316
9	0.079239	0.006423	0.001914	0.000459	0.000408	0.050776	0.139684	0.003055	0.001623	0.001596
10	0.128497	0.050382	0.0	0.000536	0.000197	0.003585	0.000201	0.008553	0.005789	0.004282
11	0.005390	0.0	0.0	0.0	0.0	0.0	0.0	0.C	0.000432	0.0
12	0.017239	0.303035	0.148350	0.013792	0.006751	0.024972	0.005832	0.026389	0.002232	0.008555
13	0.000913	0.000819	0.091981	0.001295	0.000110	0.000640	0.000871	0.000749	0.000747	0.000611
14	0.011285	0.046813	0.014765	0.259217	0.031338	0.201282	0.309745	0.022927	0.023958	0.016083
15	0.002778	0.009662	0.001847	0.011599	0.078112	0.003010	0.002539	0.007657	0.006190	0.003109
16	0.054338	0.012675	0.005110	0.017042	0.001804	0.046646	0.073487	0.011407	0.003859	0.010749
17	0.001661	0.000641	0.000164	0.000238	0.000032	0.000111	0.131229	0.000020	0.000051	0.000010
18	0.014150	0.001649	0.000729	0.003540	0.003102	0.007125	0.000327	0.106588	0.007660	0.006822
19	0.046287	0.002891	0.000972	0.015010	0.001989	0.008586	0.000654	0.006164	0.291938	0.293011
20	0.068556	0.005055	0.001331	0.017292	0.011111	0.018115	0.020957	0.009185	0.018169	0.053888
21	0.002574	0.006375	0.003287	0.015993	0.001717	0.010434	0.001332	0.006972	0.034696	0.023119
22	0.000631	0.000100	0.000182	0.000613	0.000119	0.001200	0.000528	0.001596	0.011464	0.005494
23	0.000136	0.000052	0.000103	0.000051	0.000069	0.001189	0.0	0.000255	0.000723	0.001036
24	0.004215	0.001690	0.009491	0.001629	0.000798	0.003014	0.023110	0.002742	0.002511	0.002428
25	0.000253	0.003917	0.000012	0.004802	0.001185	0.000514	0.000017	0.004117	0.020417	0.000287
26	0.0	0.0	0.0	0.002850	0.501868	0.0	0.0	0.0	0.0	0.0
27	0.0	0.003932	0.0	0.017391	0.002940	0.001749	0.000034	0.047789	0.054897	0.000511
28	0.002137	0.008761	0.003536	0.010058	0.018197	0.005495	0.000938	0.007177	0.013732	0.003105
29	0.029611	0.055263	0.032593	0.044767	0.059357	0.039375	0.012142	0.074495	0.061661	0.027508
30	0.052182	0.037703	0.026213	0.030307	0.009969	0.028504	0.043162	0.024822	0.054889	0.032214
31	0.021298	0.021963	0.046483	0.035233	0.016517	0.018353	0.017798	0.020308	0.011280	0.020087
32	0.003428	0.003287	0.010828	0.003720	0.001926	0.004199	0.005245	0.003124	0.002877	0.003309
33	0.008090	0.024161	0.005930	0.043421	0.021380	0.016478	0.005924	0.031010	0.041165	0.010681
34	0.039334	0.037959	0.078632	0.075033	0.026481	0.048333	0.032110	0.035206	0.031622	0.034472
35	0.001496	0.001972	0.013708	0.002513	0.001229	0.001058	0.003503	0.001165	0.002154	0.001032
36	0.393983	0.346216	0.500957	0.363842	0.199759	0.454537	0.454831	0.535803	0.292594	0.430178
37	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000

TABLE 1 (continued)

2. THE REST OF ARKANSAS AND OKLAHOMA (TRADE COEFFICIENTS)

FOR YEAR 1972

	21	22	23	24	25	26	27	28	29	30
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.000050	0.0
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	0.0	0.0	0.0	0.000071	0.0	0.0	0.0	0.0	0.0	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.000138	0.0	0.0
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	0.000118	0.000154	0.000167	0.001928	0.0	0.000024	0.0	0.001451	0.000127	0.000558
8	0.000651	0.000692	0.000818	0.003676	0.0	0.000293	0.000223	0.000299	0.002348	0.000651
9	0.001557	0.000869	0.007165	0.021691	0.002824	0.000131	0.001149	0.004843	0.001805	0.000666
10	0.002538	0.001884	0.011771	0.026414	0.006858	0.0	0.0	0.058609	0.000111	0.000164
11	0.000032	0.000914	0.003806	0.0	0.0	0.0	0.0	0.002552	0.0	0.0
12	0.004275	0.007748	0.004360	0.029782	0.002420	0.000113	0.006672	0.002668	0.001488	0.007008
13	0.000689	0.002890	0.001433	0.001425	0.000202	0.000125	0.000596	0.000213	0.001678	0.001861
14	0.004516	0.012249	0.009433	0.026422	0.010085	0.006934	0.021530	0.012465	0.001179	0.000537
15	0.005310	0.002232	0.003486	0.006950	0.014320	0.003906	0.046773	0.018884	0.035187	0.007153
16	0.013772	0.017976	0.014035	0.025847	0.008673	0.000262	0.015354	0.009117	0.007760	0.002177
17	0.000047	0.000050	0.000079	0.003841	0.0	0.000036	0.0	0.000027	0.000023	0.000068
18	0.005044	0.009703	0.011327	0.007257	0.004841	0.000477	0.001092	0.064555	0.000334	0.000335
19	0.135186	0.079197	0.187228	0.078320	0.012303	0.006994	0.041695	0.032547	0.001078	0.000023
20	0.037230	0.035043	0.059826	0.029483	0.015732	0.005866	0.017652	0.093699	0.001663	0.000283
21	0.138819	0.011941	0.054363	0.009783	0.053046	0.018632	0.100662	0.021721	0.002609	0.000886
22	0.048977	0.189333	0.050284	0.035701	0.002824	0.007841	0.003382	0.024682	0.002923	0.000378
23	0.004427	0.000057	0.133784	0.000197	0.000202	0.000316	0.009896	0.000337	0.016386	0.000378
24	0.004256	0.005817	0.008057	0.050191	0.000807	0.000871	0.002025	0.005316	0.001038	0.000677
25	0.000206	0.000110	0.000426	0.000047	0.119201	0.0	0.001092	0.0	0.000012	0.0
26	0.0	0.0	0.0	0.0	0.0	0.035553	0.0	0.0	0.000440	0.0
27	0.000062	0.000030	0.000009	0.000197	0.000202	0.000054	0.032733	0.008485	0.0	0.0
28	0.002495	0.002219	0.003345	0.002959	0.000269	0.043805	0.010600	0.000283	0.005195	0.004003
29	0.014873	0.014738	0.021951	0.021172	0.009480	0.006427	0.018801	0.025662	0.124414	0.012786
30	0.035405	0.027087	0.044943	0.038881	0.030254	0.005503	0.047218	0.077166	0.028228	0.013961
31	0.021128	0.021253	0.012136	0.027925	0.047196	0.168476	0.081911	0.012401	0.040490	0.055246
32	0.005035	0.005483	0.003960	0.006847	0.001008	0.002767	0.001695	0.002884	0.013151	0.014186
33	0.007919	0.007498	0.009090	0.007548	0.019968	0.014029	0.057976	0.001323	0.005234	0.015210
34	0.037498	0.060640	0.067646	0.069348	0.032876	0.032477	0.078529	0.058828	0.073771	0.087764
35	0.001404	0.001844	0.002250	0.003172	0.000807	0.001007	0.002298	0.000367	0.002972	0.005410
36	0.466429	0.472350	0.272624	0.462926	0.595603	0.637081	0.398447	0.458480	0.628306	0.767630
37	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000

TABLE 1 (continued)

2. THE REST OF ARKANSAS AND OKLAHOMA (TECHNICAL COEFFICIENT)

FOR YEAR 1972

	31	32	33	34	35
1	0.0	0.0	0.0	0.0	0.0
2	0.0	0.0	0.0	0.001180	0.0
3	0.0	0.0	0.0	0.000199	0.0
4	0.0	0.0	0.0	0.0	0.000107
5	0.000016	0.0	0.0	0.001307	0.000768
6	0.0	0.0	0.0	0.0	0.000315
7	0.000975	0.002605	0.001744	0.004231	0.000112
8	0.000444	0.000270	0.000143	0.062535	0.000374
9	0.000225	0.000415	0.000199	0.004799	0.000452
10	0.000052	0.0	0.0	0.000234	0.0
11	0.0	0.0	0.0	0.0	0.0
12	0.001687	0.000760	0.000520	0.004582	0.000259
13	0.006222	0.003197	0.001383	0.006195	0.000715
14	0.000127	0.000026	0.002353	0.010661	0.002046
15	0.002876	0.000513	0.027331	0.005098	0.001990
16	0.000635	0.000298	0.000984	0.000212	0.000245
17	0.000047	0.000037	0.000016	0.000686	0.000019
18	0.000026	0.000026	0.000102	0.002493	0.000083
19	0.000006	0.000550	0.000309	0.000163	0.000058
20	0.000026	0.000004	0.000110	0.004355	0.000207
21	0.000168	0.000109	0.002549	0.007578	0.000406
22	0.000486	0.020954	0.002113	0.005242	0.000446
23	0.000116	0.000423	0.000241	0.022273	0.000593
24	0.000700	0.000947	0.000682	0.011359	0.000179
25	0.000037	0.0	0.046047	0.000107	0.002049
26	0.0	0.0	0.073527	0.0	0.0
27	0.0	0.0	0.0	0.0	0.000028
28	0.026217	0.028021	0.035718	0.009781	0.017754
29	0.002717	0.004099	0.009418	0.013510	0.008795
30	0.004115	0.002287	0.008476	0.027360	0.001226
31	0.140479	0.037207	0.020718	0.064597	0.004757
32	0.009960	0.015387	0.004294	0.011041	0.000823
33	0.007483	0.007763	0.227044	0.013968	0.011323
34	0.053508	0.082110	0.026340	0.094500	0.006921
35	0.007972	0.004731	0.003513	0.005913	0.000336
36	0.732985	0.785969	0.504125	0.597842	0.936616
37	1.000000	1.000000	1.000000	1.000000	1.000000

TABLE 1 (continued)

3. REST OF U.S.A. (TECHNICAL COEFFICIENT)

FOR YEAR 1972

	1	2	3	4	5	6	7	8	9	10
1	0.0	0.0	0.003046	0.000239	0.006145	0.001167	0.000042	0.041957	0.0	0.0
2	0.0	0.0	0.0	0.000717	0.001760	0.001438	0.012100	0.019527	0.0	0.0
3	0.0	0.0	0.355728	0.011897	0.032274	0.014422	0.002230	0.143903	0.002026	0.0
4	0.0	0.0	0.0	0.012661	0.0	0.0	0.0	0.001771	0.018608	0.0
5	0.246512	0.160637	0.238454	0.0	0.031568	0.0	0.000817	0.026026	0.0	0.0
6	0.0	0.0	0.000149	0.0	0.0	0.055997	0.0	0.021447	0.0	0.0
7	0.025153	0.122926	0.016125	0.186812	0.018981	0.021215	0.057030	0.039027	0.001361	0.078678
8	0.138012	0.410966	0.080019	0.000047	0.000022	0.000042	0.004682	0.186421	0.001190	0.000232
9	0.001589	0.000047	0.000025	0.0	0.002816	0.000042	0.010275	0.000768	0.420526	0.001244
10	0.000354	0.000117	0.000101	0.000096	0.000111	0.000125	0.008283	0.000783	0.001614	0.298212
11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.000072
12	0.000157	0.015670	0.000035	0.0	0.000162	0.000021	0.008835	0.028409	0.011278	0.004438
13	0.000184	0.000234	0.000197	0.000239	0.000194	0.000209	0.001033	0.005745	0.000792	0.000201
14	0.005735	0.008315	0.002512	0.152221	0.086106	0.053768	0.062810	0.006284	0.077299	0.015692
15	0.004713	0.005575	0.003892	0.022790	0.029813	0.022361	0.018948	0.002298	0.002167	0.012323
16	0.003899	0.002062	0.003073	0.006355	0.006289	0.005731	0.004223	0.009549	0.008081	0.005975
17	0.0	0.0	0.000511	0.0	0.0	0.0	0.000217	0.000005	0.002925	0.000144
18	0.000381	0.0	0.000003	0.000096	0.000172	0.000021	0.001108	0.013924	0.001966	0.011253
19	0.000118	0.000188	0.000143	0.000096	0.000150	0.000188	0.000055	0.000389	0.000265	0.004495
20	0.002635	0.001124	0.001121	0.001147	0.002049	0.001125	0.007812	0.031581	0.000599	0.038732
21	0.009212	0.003021	0.004211	0.010034	0.009422	0.009482	0.008476	0.001683	0.004888	0.007330
22	0.000394	0.000258	0.000301	0.001003	0.001016	0.001000	0.001118	0.000059	0.000616	0.001048
23	0.000617	0.000281	0.000431	0.000669	0.000461	0.000542	0.005955	0.000112	0.000046	0.001793
24	0.000079	0.000094	0.000098	0.000096	0.000089	0.000104	0.001510	0.000191	0.009119	0.001311
25	0.0	0.0	0.0	0.0	0.0	0.0	0.000048	0.000298	0.000261	0.001772
26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
27	0.000066	0.0	0.0	0.003536	0.005513	0.001355	0.001317	0.000106	0.000008	0.0
28	0.036787	0.004825	0.004814	0.008696	0.009438	0.008253	0.008170	0.001893	0.001325	0.003620
29	0.036823	0.017076	0.009667	0.014381	0.016690	0.007106	0.018349	0.026457	0.016707	0.033163
30	0.022317	0.054178	0.033211	0.038653	0.035868	0.020194	0.048453	0.040767	0.039363	0.042489
31	0.044365	0.024828	0.035905	0.194504	0.135598	0.123854	0.053946	0.009265	0.015169	0.015611
32	0.002652	0.002670	0.002637	0.002628	0.002627	0.002688	0.003331	0.001519	0.003514	0.001939
33	0.006113	0.008760	0.008181	0.013856	0.009263	0.001167	0.005326	0.007174	0.009167	0.010664
34	0.010436	0.033589	0.010307	0.019255	0.019358	0.019173	0.039146	0.037551	0.028506	0.028576
35	0.000131	0.000141	0.000140	0.000143	0.000133	0.000146	0.000570	0.001059	0.001872	0.000890
36	0.431347	0.122417	0.184913	0.297135	0.535910	0.627064	0.603786	0.292051	0.318743	0.378102
37	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000

TABLE 1 (continued)

3. REST OF U.S.A. (TECHNICAL COEFFICIENT)

FOR YEAR 1972

	11	12	13	14	15	16	17	18	19	20
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	0.0	0.0	0.0	0.000080	0.0	0.0	0.0	0.0	0.0	0.0
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.000005	0.0	0.0
5	0.0	0.000549	0.0	0.000387	0.0	0.0	0.0	0.0	0.0	0.0
6	0.0	0.0	0.0	0.000379	0.0	0.0	0.0	0.0	0.0	0.0
7	0.000316	0.000289	0.000195	0.001202	0.000067	0.000300	0.000018	0.000495	0.000257	0.000475
8	0.003191	0.000112	0.000716	0.010422	0.001389	0.000387	0.083115	0.000613	0.000229	0.000317
9	0.069708	0.010657	0.002161	0.000849	0.000390	0.051507	0.067483	0.003306	0.001052	0.001495
10	0.117755	0.059647	0.0	0.001111	0.000184	0.003553	0.007371	0.009680	0.004895	0.005055
11	0.007204	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.000276	0.0
12	0.016798	0.260805	0.147476	0.021107	0.006413	0.023647	0.018439	0.028771	0.002065	0.009182
13	0.001154	0.000905	0.099442	0.002303	0.000105	0.000619	0.000510	0.000770	0.000738	0.005308
14	0.011563	0.044426	0.014839	0.220960	0.029652	0.189338	0.029008	0.031308	0.021687	0.016357
15	0.002695	0.000368	0.001882	0.009445	0.073850	0.003056	0.002634	0.008079	0.004935	0.003079
16	0.054467	0.015215	0.006171	0.020615	0.001696	0.043992	0.054591	0.015407	0.003719	0.011613
17	0.001630	0.000036	0.000172	0.000130	0.000029	0.000097	0.177676	0.000019	0.000034	0.000009
18	0.012408	0.001867	0.000841	0.006976	0.002949	0.006558	0.000893	0.107706	0.005657	0.006745
19	0.049486	0.002696	0.002145	0.007712	0.001883	0.008377	0.003844	0.007264	0.307672	0.286572
20	0.066384	0.005194	0.001586	0.020334	0.010515	0.017758	0.014684	0.009648	0.016352	0.054888
21	0.002869	0.005971	0.003380	0.009051	0.001626	0.009845	0.005292	0.007170	0.028227	0.022666
22	0.001186	0.000101	0.000181	0.000349	0.000111	0.001092	0.000720	0.002386	0.008557	0.005229
23	0.000118	0.000047	0.000101	0.000040	0.000067	0.001072	0.000037	0.000264	0.000467	0.000975
24	0.001434	0.001363	0.010147	0.001679	0.000756	0.002942	0.011661	0.003190	0.001874	0.002369
25	0.000446	0.004013	0.000010	0.002877	0.001120	0.000493	0.000165	0.004556	0.013382	0.000349
26	0.0	0.0	0.0	0.001262	0.474961	0.0	0.0	0.0	0.0	0.0
27	0.0	0.003154	0.0	0.011899	0.002740	0.001579	0.000183	0.051062	0.065677	0.000483
28	0.002179	0.008779	0.003538	0.007158	0.017220	0.005114	0.001424	0.007643	0.009547	0.003053
29	0.030322	0.050002	0.033476	0.036843	0.056159	0.036942	0.019351	0.080030	0.046178	0.027496
30	0.049605	0.040845	0.026512	0.028268	0.009434	0.027296	0.040213	0.027467	0.040470	0.031979
31	0.023883	0.019992	0.051309	0.030482	0.015625	0.017588	0.018278	0.021982	0.009759	0.019818
32	0.003350	0.002807	0.010858	0.003752	0.001822	0.004059	0.003174	0.003439	0.002173	0.003271
33	0.008200	0.023716	0.006069	0.028106	0.020229	0.015685	0.005728	0.035036	0.031836	0.010714
34	0.039453	0.035071	0.080578	0.101215	0.025053	0.047442	0.035415	0.038710	0.026624	0.034952
35	0.001416	0.001841	0.014166	0.001997	0.001163	0.001075	0.003735	0.001303	0.001599	0.001031
36	0.418700	0.383933	0.482049	0.411013	0.242793	0.478585	0.394358	0.492690	0.344060	0.434524
37	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000

TABLE 1 (continued)

3. REST OF U.S.A. (TECHNICAL COEFFICIENT)

FOR YEAR 1972

	21	22	23	24	25	26	27	28	29	30
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.000051	0.0
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	0.0	0.0	0.0	0.000024	0.0	0.0	0.0	0.0	0.0	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.000137	0.0	0.0
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	0.000106	0.000150	0.000089	0.000768	0.0	0.000022	0.0	0.001451	0.000165	0.000557
8	0.000651	0.000671	0.000420	0.002002	0.000074	0.000274	0.000181	0.000299	0.002486	0.000651
9	0.001267	0.001734	0.016940	0.013174	0.002830	0.000123	0.000461	0.004843	0.001908	0.000665
10	0.002461	0.002288	0.009562	0.015017	0.006982	0.0	0.001997	0.058609	0.000099	0.000164
11	0.000024	0.000108	0.004016	0.0	0.0	0.0	0.0	0.002552	0.0	0.0
12	0.003968	0.009084	0.001970	0.023302	0.002462	0.000106	0.001998	0.002667	0.001472	0.007008
13	0.000747	0.002240	0.000729	0.000917	0.000147	0.000117	0.000259	0.000213	0.001908	0.001861
14	0.004371	0.014804	0.006158	0.026098	0.010344	0.006502	0.022263	0.012465	0.001500	0.000537
15	0.005070	0.002351	0.002200	0.004472	0.014588	0.003665	0.018926	0.018885	0.036471	0.007153
16	0.013627	0.019257	0.021813	0.026168	0.008801	0.000246	0.012913	0.009117	0.006418	0.002177
17	0.000044	0.000045	0.000041	0.001903	0.0	0.000034	0.0	0.000027	0.000024	0.000067
18	0.004951	0.013255	0.011801	0.005628	0.004924	0.000447	0.003120	0.064556	0.000480	0.000334
19	0.126870	0.087797	0.086243	0.076613	0.012678	0.006558	0.028110	0.032546	0.003362	0.000023
20	0.015615	0.036489	0.083880	0.025819	0.016150	0.005502	0.012040	0.093699	0.002726	0.000283
21	0.134630	0.015060	0.038706	0.006669	0.054275	0.017479	0.044638	0.021721	0.004433	0.000886
22	0.047693	0.163920	0.039164	0.029098	0.002811	0.007357	0.002521	0.024682	0.003393	0.000379
23	0.003909	0.000058	0.194211	0.012962	0.000221	0.000296	0.007266	0.000337	0.020234	0.000378
24	0.004139	0.006564	0.004598	0.054904	0.000900	0.000816	0.002208	0.005316	0.001154	0.000677
25	0.000184	0.000132	0.000323	0.000428	0.122055	0.0	0.001138	0.0	0.000013	0.0
26	0.0	0.0	0.0	0.0	0.0	0.033350	0.0	0.0	0.000457	0.0
27	0.000047	0.000089	0.000003	0.000430	0.000294	0.000050	0.056750	0.008485	0.0	0.0
28	0.002535	0.002349	0.001941	0.003720	0.008415	0.041092	0.011186	0.000283	0.031069	0.004003
29	0.014712	0.015775	0.017612	0.020406	0.009793	0.006027	0.014929	0.025662	0.121473	0.012786
30	0.034048	0.028922	0.045537	0.032828	0.031033	0.005162	0.027549	0.077165	0.025017	0.013960
31	0.021514	0.021834	0.007201	0.023091	0.048340	0.158039	0.077516	0.012402	0.041462	0.055247
32	0.004834	0.005303	0.002103	0.006012	0.000955	0.002598	0.000980	0.002884	0.012024	0.014186
33	0.007641	0.006032	0.005278	0.008079	0.020450	0.013161	0.047739	0.001323	0.008171	0.015210
34	0.037121	0.059743	0.037706	0.070190	0.033660	0.030467	0.040130	0.058828	0.069447	0.087765
35	0.001394	0.001704	0.001191	0.002590	0.000864	0.000944	0.002446	0.000367	0.002901	0.005410
36	0.483829	0.474243	0.358566	0.504690	0.585955	0.659566	0.560736	0.458480	0.599681	0.767532
37	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000

TABLE 1 (continued)

3. REST OF U.S.A. (TECHNICAL COEFFICIENT)

FOR YEAR 1972

	31	32	33	34	35
1	0.0	0.0	0.0	0.0	0.0
2	0.0	0.0	0.0	0.001189	0.0
3	0.0	0.0	0.0	0.000197	0.0
4	0.0	0.0	0.0	0.0	0.000106
5	0.000080	0.0	0.0	0.001295	0.000768
6	0.0	0.0	0.0	0.0	0.000315
7	0.002860	0.002608	0.001743	0.004219	0.000112
8	0.000369	0.000269	0.000142	0.062508	0.000374
9	0.000187	0.000416	0.000199	0.004823	0.000452
10	0.000092	0.0	0.0	0.000267	0.0
11	0.0	0.0	0.0	0.0	0.0
12	0.001403	0.000759	0.000520	0.004600	0.000259
13	0.005174	0.003196	0.001382	0.006255	0.000716
14	0.000304	0.000025	0.002351	0.010600	0.002046
15	0.002392	0.000510	0.027331	0.005090	0.001991
16	0.001084	0.000285	0.000985	0.006232	0.000245
17	0.000039	0.000036	0.000016	0.000680	0.000019
18	0.000021	0.000031	0.000102	0.002470	0.000083
19	0.000005	0.000549	0.000309	0.000192	0.000057
20	0.000058	0.000003	0.000110	0.004527	0.000207
21	0.000240	0.000108	0.002546	0.007508	0.000406
22	0.000238	0.020954	0.002112	0.005194	0.000446
23	0.000119	0.000424	0.000241	0.022065	0.000593
24	0.000582	0.000945	0.000682	0.011375	0.000179
25	0.000006	0.0	0.046046	0.000106	0.002049
26	0.0	0.0	0.073527	0.0	0.0
27	0.0	0.0	0.0	0.0	0.000028
28	0.044288	0.028022	0.035717	0.009795	0.017754
29	0.002411	0.004099	0.009418	0.013552	0.008794
30	0.003573	0.002287	0.008477	0.027252	0.001226
31	0.131230	0.037205	0.020719	0.064831	0.004757
32	0.008282	0.015987	0.004293	0.011027	0.000823
33	0.006222	0.007764	0.227047	0.014238	0.011323
34	0.047604	0.082811	0.026340	0.094094	0.006921
35	0.008223	0.004729	0.003514	0.005977	0.000335
36	0.732985	0.785977	0.504130	0.597843	0.936617
37	1.000000	1.000000	1.000000	1.000000	1.000000

TABLE 2
Interindustry Transaction Matrix in 1972

1. WATER COUNTIES ($000,000)

FOR YEAR 1972

	1	2	3	4	5	6	7	8	9	10
1	0.0	0.0	0.479	0.010	1.185	0.069	0.005	65.552	0.0	0.0
2	0.0	0.0	0.0	0.031	0.340	0.086	0.011	35.179	0.0	0.0
3	0.0	0.0	55.667	0.517	6.212	0.856	0.188	266.684	0.256	0.0
4	0.0	0.0	0.0	0.551	0.0	0.0	0.0	3.455	3.400	0.0
5	13.794	16.098	36.717	0.0	5.998	0.0	0.0	19.502	0.0	0.0
6	0.0	0.0	0.023	0.0	0.0	3.324	0.0	32.136	0.0	0.0
7	1.407	12.319	2.508	8.124	3.577	1.259	6.557	25.499	0.335	14.431
8	7.723	41.182	11.717	0.002	0.004	0.002	0.003	235.541	0.234	0.032
9	0.089	0.004	0.004	0.0	0.538	0.002	0.241	0.958	82.072	0.217
10	0.020	0.012	0.016	0.004	0.020	0.008	1.355	0.688	0.081	40.035
11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.013
12	0.009	1.570	0.005	0.0	0.027	0.001	0.218	37.765	1.246	0.746
13	0.011	0.023	0.030	0.010	0.038	0.012	0.019	6.908	0.086	0.027
14	0.377	0.833	0.373	6.619	16.495	3.192	7.410	9.636	5.808	1.266
15	0.264	0.559	0.583	0.991	5.702	1.327	1.528	3.206	0.340	2.092
16	0.219	0.206	0.478	0.276	1.155	0.341	0.476	13.495	0.588	0.730
17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.011	0.627	0.026
18	0.021	0.0	0.0	0.004	0.034	0.001	0.070	17.918	0.318	1.616
19	0.007	0.019	0.022	0.004	0.029	0.011	0.005	0.469	0.027	0.705
20	0.158	0.113	0.167	0.050	0.393	0.067	0.095	37.259	0.157	6.236
21	0.291	0.303	0.658	0.436	1.793	0.563	0.469	2.081	0.619	1.158
22	0.022	0.026	0.047	0.044	0.194	0.059	0.045	0.090	0.098	0.166
23	0.035	0.028	0.067	0.029	0.088	0.032	0.028	0.172	0.009	0.323
24	0.004	0.010	0.015	0.004	0.017	0.007	0.007	0.274	2.171	0.168
25	0.0	0.0	0.0	0.0	0.0	0.0	0.009	0.266	0.050	0.292
26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
27	0.004	0.0	0.0	0.153	1.063	0.080	0.172	0.153	0.003	0.0
28	0.380	0.484	0.745	0.378	1.817	0.490	0.533	2.362	0.209	0.374
29	2.061	1.710	1.478	0.625	3.190	0.422	1.133	34.319	2.720	4.417
30	1.249	5.429	5.100	1.680	6.858	1.199	5.171	57.518	6.887	5.974
31	2.484	2.489	5.527	8.458	25.974	7.351	3.508	12.019	2.549	2.105
32	0.149	0.268	0.413	0.114	0.502	0.159	0.213	2.232	0.672	0.279
33	0.454	0.878	1.255	0.602	1.775	0.069	0.496	9.566	1.361	1.402
34	0.584	3.366	1.566	0.837	3.692	1.138	1.146	42.611	5.312	4.198
35	0.007	0.014	0.022	0.006	0.026	0.009	0.011	1.482	0.390	0.138
36	8.329	10.365	35.919	12.919	47.012	37.221	9.972	271.365	64.675	57.540
37	40.152	98.308	161.601	43.478	135.748	59.357	41.094	1268.371	183.300	146.704

TABLE 2 (continued)

1. WATER COUNTIES ($000,000)

FOR YEAR 1972

	11	12	13	14	15	16	17	18	19	20
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	0.0	0.0	0.0	0.005	0.0	0.0	0.0	0.0	0.0	0.0
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.001	0.0	0.0
5	0.0	0.279	0.0	0.018	0.0	0.0	0.0	0.0	0.0	0.0
6	0.0	0.0	0.0	0.023	0.0	0.0	0.0	0.0	0.0	0.0
7	0.071	0.139	0.038	0.060	0.058	0.073	0.0	0.112	0.068	0.269
8	0.693	2.422	0.126	0.496	1.064	0.087	0.043	0.099	0.148	0.176
9	15.098	4.392	0.317	0.016	0.225	11.436	5.210	0.153	0.233	0.872
10	23.558	24.786	0.0	0.007	0.240	0.816	0.054	1.818	1.315	2.442
11	1.437	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.064	0.0
12	3.285	113.275	27.889	0.754	4.593	5.617	0.640	3.586	0.626	4.455
13	0.241	0.315	15.817	0.110	0.090	0.144	0.018	0.116	0.210	1.574
14	2.207	17.844	2.721	9.061	25.284	45.105	0.341	4.478	3.591	8.763
15	0.524	4.215	0.349	0.358	64.822	0.677	0.060	1.597	1.178	1.697
16	10.925	4.649	0.865	0.869	1.710	10.476	2.182	3.648	0.539	6.064
17	0.355	0.018	0.021	0.007	0.024	0.024	2.721	0.004	0.012	0.005
18	2.356	0.759	0.136	0.266	2.054	1.599	0.001	27.172	2.604	3.869
19	7.333	1.009	0.241	0.438	1.581	1.922	0.001	1.257	56.825	150.263
20	12.729	2.189	0.227	0.866	8.941	4.054	0.269	2.345	2.976	30.188
21	0.485	2.554	0.653	0.427	1.380	2.336	0.036	1.219	17.616	12.668
22	0.122	0.039	0.034	0.019	0.094	0.269	0.016	0.327	4.235	3.076
23	0.024	0.020	0.020	0.002	0.058	0.266	0.0	0.056	0.118	0.586
24	0.757	0.640	1.810	0.077	0.603	0.682	0.169	0.585	0.855	1.340
25	0.691	1.864	0.002	0.130	1.010	0.115	0.0	0.689	3.159	0.159
26	0.0	0.0	0.0	0.063	401.893	0.0	0.0	0.0	0.0	0.0
27	0.0	1.485	0.0	0.530	3.654	0.392	0.0	11.265	7.996	0.287
28	0.420	3.647	0.670	0.323	14.583	1.230	0.037	1.305	3.982	1.670
29	5.755	21.867	5.944	1.572	48.113	8.832	0.319	17.079	13.357	13.804
30	9.895	16.642	4.914	1.203	8.051	6.397	0.963	5.641	14.896	17.163
31	4.229	8.411	8.170	1.334	13.444	4.117	0.465	4.317	3.553	10.801
32	0.646	1.198	2.061	0.159	1.555	0.944	0.095	0.710	1.098	1.813
33	1.479	10.011	1.115	1.214	17.296	3.694	0.117	5.678	10.322	5.696
34	7.696	15.171	14.633	4.100	21.371	10.860	1.799	8.056	9.624	17.752
35	0.269	0.771	2.499	0.091	0.987	0.239	0.154	0.247	0.473	0.573
36	75.333	143.668	94.419	14.774	111.727	104.665	13.065	114.368	108.074	221.357
37	183.013	404.279	185.691	39.372	756.495	227.068	28.795	217.928	269.747	519.382

TABLE 2 (continued)

1. WATER COUNTIES ($000,000)

FOR YEAR 1972

	21	22	23	24	25	26	27	28	29	30
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.013	0.0
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	0.0	0.0	0.0	0.014	0.0	0.0	0.0	0.0	0.0	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.162	0.0	0.0
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	0.070	0.120	0.064	0.375	0.0	0.003	0.0	1.713	0.034	0.840
8	0.421	0.488	0.228	0.710	0.001	0.040	0.006	0.353	0.655	0.981
9	0.903	0.993	8.756	3.981	0.067	0.017	0.028	5.718	0.547	1.004
10	1.628	1.513	8.304	4.985	0.166	0.0	0.0	69.205	0.038	0.246
11	0.006	5.310	2.119	0.0	0.0	0.0	0.0	3.013	0.0	0.0
12	2.625	5.381	3.149	7.303	0.059	0.015	0.163	3.149	0.514	10.557
13	0.471	1.088	0.458	0.239	0.004	0.017	0.015	0.252	0.571	2.804
14	3.157	6.344	5.852	8.677	0.246	0.950	0.525	14.718	0.390	0.809
15	3.157	1.500	1.696	1.408	0.347	0.535	1.141	22.298	11.595	10.776
16	9.381	11.698	15.045	6.696	0.209	0.036	0.374	10.766	2.930	3.280
17	0.034	0.036	0.024	0.594	0.0	0.005	0.0	0.031	0.008	0.102
18	3.071	5.061	10.277	1.649	0.117	0.065	0.027	76.227	0.093	0.504
19	76.794	54.107	127.689	15.920	0.302	0.958	1.017	38.431	0.292	0.038
20	22.354	23.996	54.491	6.102	0.384	0.804	0.430	110.640	0.488	0.426
21	62.405	10.919	30.233	1.587	1.290	2.552	2.455	25.649	0.784	1.335
22	32.461	136.455	17.906	6.391	0.067	1.074	0.083	29.145	0.866	0.571
23	3.081	0.057	104.624	0.048	0.005	0.043	0.242	0.398	5.006	0.570
24	3.113	3.534	2.365	14.418	0.022	0.119	0.049	6.278	0.301	1.020
25	0.132	0.062	0.350	0.084	2.903	0.0	0.027	0.0	0.003	0.0
26	0.0	0.0	0.0	0.0	0.0	4.870	0.0	0.0	0.073	0.0
27	0.042	0.055	0.0	0.005	0.007	0.007	0.798	10.020	0.0	0.0
28	1.625	1.636	1.777	0.867	0.200	6.000	0.259	0.335	1.489	6.030
29	9.104	9.584	14.187	5.257	0.234	0.880	0.459	30.301	44.214	19.261
30	22.353	19.096	35.629	9.290	0.738	0.754	1.152	91.116	10.391	21.031
31	13.557	13.067	6.236	6.336	1.150	23.076	1.998	14.644	13.292	83.227
32	3.200	3.822	1.648	1.491	0.023	0.379	0.041	3.405	4.824	21.370
33	4.756	4.838	5.345	1.693	0.486	1.922	1.414	1.562	1.365	22.918
34	23.948	42.046	33.154	17.052	0.800	4.448	1.915	69.464	25.753	132.214
35	0.864	1.373	1.191	0.623	0.020	0.138	0.056	0.433	1.019	8.149
36	284.994	307.049	163.302	105.491	13.574	86.043	9.176	541.372	218.596	1156.400
37	609.707	673.178	656.099	229.286	23.421	135.750	23.850	1180.798	346.144	1506.455

TABLE 2 (continued)

1. WATER COUNTIES ($000,000)

FOR YEAR 1972

	31	32	33	34	35	36	37	38	39	40
1	0.0	0.0	0.0	0.0	0.0	67.300	1.204	0.0	0.0	0.0
2	0.0	0.0	0.0	2.052	0.0	37.712	11.404	0.0	-0.113	0.0
3	0.0	0.0	0.0	0.346	0.0	350.731	1.836	0.0	2.662	0.0
4	0.0	0.0	0.0	0.0	0.100	7.521	0.0	0.0	0.016	0.0
5	0.029	0.0	0.0	2.275	0.721	95.593	1.528	0.0	0.100	0.0
6	0.0	0.0	0.0	0.0	0.295	35.801	0.173	0.0	0.027	0.0
7	1.685	0.735	0.823	7.365	0.105	90.836	46.565	0.0	0.388	-1.132
8	0.768	0.076	0.067	108.851	0.352	415.791	699.566	0.0	0.150	0.0
9	0.388	0.117	0.095	8.352	0.425	153.468	248.396	3.324	2.427	0.0
10	0.003	0.0	0.0	0.407	0.0	183.770	5.181	0.006	0.103	0.0
11	0.0	0.0	0.0	0.0	0.0	11.962	58.446	34.169	1.485	0.0
12	2.916	0.214	0.246	7.976	0.243	250.817	24.873	0.0	0.578	0.0
13	10.756	0.902	0.653	10.783	0.673	55.485	48.192	0.0	1.578	0.0
14	0.220	0.007	1.110	18.557	1.923	234.889	122.776	0.0	0.368	0.0
15	4.972	0.144	12.903	8.873	1.869	175.283	137.896	0.0	1.507	0.0
16	1.187	0.061	0.465	10.813	0.230	133.072	43.126	0.661	5.750	0.0
17	0.082	0.009	0.007	1.195	0.018	6.000	44.993	0.0	0.403	0.0
18	0.044	0.009	0.048	4.341	0.078	162.407	10.651	0.0	8.032	0.0
19	0.009	0.155	0.146	0.283	0.054	538.359	0.297	0.0	1.464	0.0
20	0.044	0.0	0.051	7.580	0.195	337.464	16.678	43.291	19.883	0.0
21	0.324	0.031	1.203	13.191	0.381	222.084	10.449	426.156	22.193	0.0
22	0.495	5.910	0.997	9.123	0.418	252.984	118.429	126.134	17.233	0.0
23	0.201	0.119	0.114	38.769	0.558	155.796	304.666	408.755	35.592	0.0
24	1.211	0.266	0.322	19.772	0.168	63.153	86.694	66.439	2.439	0.0
25	0.013	0.0	21.739	0.187	1.924	35.260	1.022	0.0	0.109	0.0
26	0.0	0.0	34.714	0.0	0.0	441.603	0.0	0.0	1.488	0.0
27	0.0	0.0	0.0	0.0	0.026	38.197	0.071	0.0	0.074	0.0
28	45.323	7.904	16.863	17.024	16.678	159.649	0.0	1461.974	0.0	0.0
29	4.697	1.158	4.447	23.517	8.263	364.240	170.119	12.175	1.075	23.595
30	7.115	0.645	4.001	47.623	1.151	454.915	1288.826	103.134	7.342	72.295
31	242.853	10.495	9.781	112.440	4.468	687.945	1203.574	72.856	0.0	13.367
32	17.218	4.509	2.026	19.220	0.773	99.229	113.742	41.633	0.0	5.042
33	12.936	2.190	107.191	24.313	10.636	278.041	214.532	0.0	0.0	0.0
34	92.502	23.358	12.435	164.490	6.502	825.593	1413.300	0.0	0.0	6.247
35	13.609	1.334	1.659	10.292	0.315	49.483	37.930	0.0	0.0	0.782
36	1267.139	221.701	238.006	1040.624	879.869	8090.103	0.0	0.0	0.0	0.0
37	1728.739	282.069	472.112	1740.634	939.411	15562.536	6487.135	2800.707	134.353	120.196

TABLE 2 (continued)

1. WATER COUNTIES ($000,000)

FOR YEAR 1972

	41	42	43	44
1	0.0	0.0	1.204	68.504
2	0.020	1.405	12.716	50.428
3	0.020	0.030	4.548	355.279
4	0.173	0.0	0.189	7.710
5	-6.514	0.230	-4.656	90.937
6	-1.466	0.0	-1.266	34.535
7	-2.947	0.278	43.152	133.988
8	2.754	13.806	716.276	1132.067
9	2.961	0.410	257.518	410.986
10	0.429	0.005	5.724	189.494
11	1.642	2.114	97.856	109.818
12	1.588	2.164	29.203	280.020
13	3.672	10.535	63.977	119.462
14	10.346	0.753	134.243	369.132
15	8.063	18.122	165.588	340.871
16	2.670	4.361	56.568	189.640
17	0.098	0.008	45.502	51.502
18	0.413	2.120	21.216	183.623
19	2.277	0.059	4.097	542.456
20	4.092	1.156	85.090	422.554
21	14.101	3.888	476.787	698.871
22	61.545	4.760	328.101	581.085
23	92.951	3.867	845.831	1001.627
24	57.619	0.404	213.795	276.948
25	0.460	0.027	1.618	36.878
26	0.0	0.0	1.488	443.091
27	-0.325	0.007	-0.173	38.024
28	53.436	440.446	1955.856	2115.505
29	25.225	15.706	247.895	612.135
30	11.062	10.898	1493.557	1948.472
31	11.622	31.540	1332.959	2020.904
32	8.321	16.185	184.923	284.152
33	6.078	30.402	251.012	529.053
34	63.798	88.876	1572.221	2397.814
35	449.499	1175.232	1663.433	1712.916
36	0.0	0.0	0.0	8090.103
37	885.863	1879.794	12308.048	27870.584

TABLE 2 (continued)

2. THE REST OF ARKANSAS AND OKLAHOMA ($000,000)

FOR YEAR 1972

	1	2	3	4	5	6	7	8	9	10
1	0.0	0.0	2.562	0.051	4.650	0.287	0.029	79.649	0.0	0.0
2	0.0	0.0	0.0	0.151	1.331	0.354	0.057	35.765	0.0	0.0
3	0.0	0.0	297.867	2.513	24.357	3.547	0.965	291.462	0.330	0.0
4	0.0	0.0	0.0	2.674	0.0	0.0	0.0	3.470	5.762	0.0
5	73.178	61.701	196.470	0.0	23.517	0.0	0.0	27.168	0.0	0.0
6	0.0	0.0	0.125	0.0	0.0	13.777	0.0	23.140	0.0	0.0
7	7.467	47.215	13.421	39.461	14.024	5.219	33.583	25.203	0.818	54.823
8	40.967	157.841	62.691	0.011	0.017	0.010	0.017	276.851	0.478	0.122
9	0.471	0.018	0.022	0.0	2.108	0.010	1.235	1.191	196.135	0.822
10	0.105	0.045	0.085	0.020	0.080	0.031	6.939	0.662	0.264	152.162
11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.051
12	0.047	6.019	0.029	0.0	0.105	0.006	1.115	40.955	3.827	2.836
13	0.055	0.090	0.160	0.051	0.147	0.051	0.098	7.686	0.257	0.103
14	1.999	3.194	1.999	32.154	64.674	13.227	37.954	10.619	18.358	4.815
15	1.399	2.141	3.119	4.814	22.357	5.502	7.824	3.531	0.847	7.947
16	1.157	0.791	2.559	1.342	4.528	1.409	2.441	14.916	2.621	2.761
17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.011	1.714	0.101
18	0.113	0.0	0.002	0.020	0.130	0.006	0.362	19.528	0.473	6.194
19	0.035	0.071	0.118	0.020	0.113	0.046	0.029	0.532	0.078	2.678
20	0.842	0.432	0.893	0.242	1.541	0.277	0.482	47.077	0.301	23.710
21	1.547	1.161	3.521	2.119	7.031	2.333	2.401	2.483	1.367	4.410
22	0.117	0.099	0.251	0.212	0.761	0.246	0.230	0.097	0.310	0.630
23	0.183	0.108	0.360	0.142	0.344	0.133	0.144	0.183	0.022	1.229
24	0.023	0.036	0.082	0.020	0.067	0.026	0.035	0.335	5.376	0.639
25	0.0	0.0	0.0	0.0	0.0	0.0	0.046	0.282	0.082	1.109
26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
27	0.019	0.0	0.0	0.747	4.166	0.334	0.885	0.162	0.003	0.0
28	2.015	1.853	3.990	1.837	7.124	2.030	2.728	2.637	0.463	1.423
29	10.932	6.559	7.905	3.038	12.508	1.749	5.802	36.859	6.282	16.797
30	6.625	20.810	27.289	8.165	26.890	4.968	26.488	63.057	16.607	22.745
31	13.177	9.537	29.570	41.086	101.845	30.465	17.969	12.910	6.504	7.987
32	0.787	1.025	2.210	0.555	1.969	0.662	1.091	2.445	1.691	1.065
33	2.408	3.365	6.720	2.927	6.960	0.287	2.539	10.412	3.180	5.337
34	3.099	12.902	8.381	4.067	14.478	4.717	5.865	47.257	12.895	15.985
35	0.039	0.054	0.115	0.031	0.100	0.036	0.057	1.570	0.937	0.524
36	34.385	39.296	189.132	62.760	260.503	154.251	43.240	312.665	151.464	217.514
37	203.191	376.363	861.648	211.230	608.425	245.996	202.650	1402.770	439.446	556.519

TABLE 2 (continued)

2. THE REST OF ARKANSAS AND OKLAHOMA ($000,000)

FOR YEAR 1972

	11	12	13	14	15	16	17	18	19	20
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	0.0	0.0	0.0	0.050	0.0	0.0	0.0	0.0	0.0	0.0
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	0.0	0.225	0.0	0.160	0.0	0.0	0.0	0.0	0.0	0.0
6	0.0	0.0	0.0	0.021	0.0	0.0	0.0	0.0	0.0	0.0
7	0.042	0.101	0.033	0.158	0.024	0.086	0.0	0.078	0.098	0.104
8	0.404	1.618	0.112	1.726	0.507	0.101	1.647	0.070	0.072	0.065
9	8.159	1.733	0.315	0.125	0.141	13.241	16.670	0.624	0.413	0.328
10	13.231	13.594	0.0	0.146	0.068	0.935	0.024	1.747	1.473	0.880
11	0.555	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.110	0.0
12	1.775	81.765	24.415	3.760	2.335	6.512	0.696	5.390	0.568	1.758
13	0.094	0.221	15.138	0.353	0.038	0.167	0.104	0.153	0.190	1.153
14	1.162	12.631	2.430	70.666	10.639	52.489	1.163	4.683	6.096	3.305
15	0.286	2.607	0.304	3.162	27.017	0.785	0.303	1.564	1.575	0.639
16	5.505	3.420	0.841	4.646	0.624	12.164	8.770	2.330	0.982	2.209
17	0.171	0.011	0.027	0.065	0.011	0.029	15.661	0.004	0.013	0.002
18	1.457	0.445	0.120	0.965	1.073	1.858	0.039	21.771	1.949	1.402
19	4.766	0.780	0.160	4.092	0.688	2.239	0.078	1.259	74.281	60.214
20	7.059	1.364	0.219	4.714	3.843	4.724	2.501	1.876	4.623	11.074
21	0.265	1.720	0.541	4.360	0.594	2.721	0.159	1.424	8.828	4.751
22	0.055	0.027	0.030	0.167	0.041	0.313	0.063	0.326	2.917	1.129
23	0.014	0.014	0.017	0.014	0.024	0.310	0.0	0.052	0.184	0.213
24	0.434	0.456	1.562	0.444	0.276	0.786	2.758	0.560	0.639	0.499
25	0.026	1.057	0.002	1.309	0.410	0.134	0.002	0.841	5.195	0.059
26	0.0	0.0	0.0	0.777	173.584	0.0	0.0	0.0	0.0	0.0
27	0.0	1.061	0.0	4.741	1.017	0.456	0.004	9.761	13.968	0.105
28	0.220	2.364	0.582	2.742	6.294	1.433	0.112	1.466	3.494	0.638
29	3.049	14.911	5.364	12.204	20.530	10.268	1.449	15.216	15.689	5.653
30	5.373	10.173	4.314	8.262	3.448	7.433	5.151	5.070	13.966	6.620
31	2.193	5.926	7.650	9.605	5.713	4.786	2.124	4.148	2.870	4.128
32	0.353	0.887	1.782	1.014	0.666	1.095	0.626	0.638	0.732	0.680
33	0.833	6.519	0.976	11.837	7.395	4.297	0.707	6.334	10.474	2.195
34	4.047	10.242	12.941	20.455	9.159	12.604	3.832	7.191	8.046	7.084
35	0.154	0.532	2.256	0.685	0.425	0.276	0.418	0.238	0.548	0.212
36	41.185	93.416	82.446	99.188	69.092	118.531	54.280	109.440	74.448	88.402
37	102.967	269.820	164.577	272.613	345.876	260.773	119.341	204.254	254.441	205.501

TABLE 2 (continued)

2. THE REST OF ARKANSAS AND OKLAHOMA ($000,000)

FOR YEAR 1972

	21	22	23	24	25	26	27	28	29	30
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.036	0.0
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	0.0	0.0	0.0	0.009	0.0	0.0	0.0	0.0	0.0	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.189	0.0	0.0
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	0.055	0.046	0.038	0.245	0.0	0.026	0.0	1.993	0.092	1.133
8	0.303	0.207	0.186	0.467	0.0	0.319	0.031	0.411	1.707	1.323
9	0.725	0.260	1.630	2.756	0.014	0.143	0.160	6.654	1.312	1.354
10	1.182	0.564	2.678	3.356	0.034	0.0	0.0	80.523	0.081	0.333
11	0.015	2.668	0.866	0.0	0.0	0.0	0.0	3.506	0.0	0.0
12	1.991	2.319	0.992	3.784	0.012	0.123	0.929	3.665	1.082	14.241
13	0.321	0.865	0.326	0.181	0.001	0.136	0.083	0.293	1.220	3.782
14	2.150	3.666	2.146	3.357	0.050	7.558	2.998	17.126	0.857	1.092
15	2.473	0.668	0.793	0.883	0.071	4.257	6.513	25.945	25.562	14.536
16	6.414	5.380	3.193	3.284	0.043	0.286	2.138	12.526	5.642	4.424
17	0.022	0.015	0.018	0.488	0.0	0.039	0.0	0.037	0.017	0.138
18	2.349	2.904	2.577	0.922	0.024	0.520	0.152	88.693	0.243	0.680
19	62.960	23.703	42.596	9.951	0.061	7.623	5.806	44.716	0.784	0.047
20	17.339	10.488	13.611	3.746	0.078	6.394	2.458	128.733	1.209	0.575
21	64.652	3.574	12.368	1.243	0.263	20.308	14.017	29.843	1.897	1.801
22	22.810	56.666	11.440	4.536	0.014	8.546	0.471	33.911	2.125	0.769
23	2.062	0.017	30.437	0.025	0.001	0.344	1.378	0.463	11.913	0.769
24	1.982	1.741	1.833	6.377	0.004	0.949	0.282	7.303	0.755	1.376
25	0.096	0.033	0.097	0.006	0.591	0.0	0.152	0.0	0.009	0.0
26	0.0	0.0	0.0	0.0	0.0	38.751	0.0	0.0	0.320	0.0
27	0.029	0.009	0.002	0.025	0.001	0.059	4.558	11.658	0.0	0.0
28	1.162	0.664	0.761	0.376	0.041	47.745	1.476	0.389	3.777	8.134
29	6.927	4.411	4.994	2.690	0.047	7.005	2.618	35.257	90.454	25.982
30	16.489	8.107	10.225	4.940	0.150	5.998	6.575	106.018	20.523	28.369
31	9.840	6.361	2.761	3.548	0.234	183.630	11.406	17.038	29.438	112.265
32	2.345	1.641	0.901	0.870	0.005	3.016	0.236	3.962	9.561	28.827
33	3.686	2.244	2.068	0.959	0.099	15.291	8.073	1.817	3.805	30.908
34	17.464	18.149	15.390	8.811	0.163	35.398	10.935	80.824	53.634	178.344
35	0.654	0.552	0.512	0.403	0.004	1.098	0.320	0.504	2.161	10.993
36	217.229	141.371	62.070	58.817	2.953	694.383	55.483	629.907	456.802	1559.884
37	465.728	299.293	227.509	127.055	4.958	1089.945	139.248	1373.904	727.038	2032.079

TABLE 2 (continued)

2. THE REST OF ARKANSAS AND OKLAHOMA ($000,000)

FOR YEAR 1972

	31	32	33	34	35	36	37	38	39	40
1	0.0	0.0	0.0	0.0	0.0	87.228	2.284	0.0	0.0	0.0
2	0.0	0.0	0.0	2.616	0.0	40.310	21.634	0.0	-0.509	0.0
3	0.0	0.0	0.0	0.441	0.0	621.532	3.484	0.0	11.700	0.0
4	0.0	0.0	0.0	0.0	0.212	12.127	0.0	0.0	0.118	0.0
5	0.035	0.0	0.0	2.898	1.525	387.066	2.897	0.0	0.510	0.0
6	0.0	0.0	0.0	0.0	0.626	37.689	0.329	0.0	0.119	0.0
7	2.080	0.696	0.953	9.384	0.222	258.921	88.336	0.0	1.693	-4.940
8	0.948	0.072	0.078	138.681	0.743	690.803	1327.099	0.0	0.188	0.0
9	0.479	0.111	0.109	10.642	0.897	271.007	471.215	8.235	6.014	0.0
10	0.004	0.0	0.0	0.518	0.0	281.764	9.829	0.031	0.522	0.0
11	0.0	0.0	0.0	0.0	0.0	7.771	110.874	23.983	1.043	0.0
12	3.599	0.203	0.284	10.162	0.515	227.814	47.184	0.0	0.607	0.0
13	13.275	0.854	0.756	13.738	1.421	63.561	91.423	0.0	1.272	0.0
14	0.271	0.007	1.286	23.643	4.065	424.729	232.910	0.0	1.703	0.0
15	6.137	0.137	14.939	11.305	3.954	215.916	261.592	0.0	1.758	0.0
16	1.464	0.077	0.538	13.776	0.486	135.777	81.812	0.716	6.232	0.0
17	0.101	0.010	0.009	1.522	0.037	20.273	85.353	0.0	1.248	0.0
18	0.055	0.007	0.056	5.529	0.165	162.783	20.205	0.0	6.022	0.0
19	0.012	0.147	0.169	0.361	0.115	351.328	0.563	0.0	0.977	0.0
20	0.055	0.001	0.060	9.657	0.411	312.609	31.639	16.338	7.504	0.0
21	0.401	0.029	1.393	16.806	0.807	223.138	19.823	282.857	14.730	0.0
22	0.610	5.598	1.155	11.624	0.886	169.192	224.664	68.603	9.373	0.0
23	0.248	0.113	0.132	49.394	1.178	102.164	577.962	113.030	9.842	0.0
24	1.494	0.253	0.373	25.190	0.355	65.320	164.461	31.354	1.151	0.0
25	0.016	0.0	25.169	0.238	4.070	41.031	1.939	0.0	0.012	0.0
26	0.0	0.0	40.189	0.0	0.0	253.621	0.0	0.0	8.898	0.0
27	0.0	0.0	0.0	0.0	0.055	53.825	0.135	0.0	0.419	0.0
28	55.934	7.486	19.523	21.691	35.267	249.871	0.0	1399.492	0.0	0.0
29	3.737	1.095	5.148	29.961	17.471	452.621	322.720	15.779	1.296	11.466
30	8.780	0.611	4.633	60.674	2.435	577.981	2444.944	122.059	8.689	85.561
31	299.713	9.940	11.324	143.253	9.449	1170.393	2283.219	72.768	0.0	13.351
32	21.250	4.271	2.347	24.486	1.635	127.326	215.771	30.280	0.0	3.667
33	15.965	2.074	124.100	30.976	22.492	360.261	406.974	0.0	0.0	0.0
34	114.159	22.123	14.397	209.569	13.749	1018.356	2681.076	0.0	0.0	6.903
35	16.795	1.264	1.920	13.112	0.667	60.166	71.954	0.0	0.0	1.483
36	1563.823	209.974	275.549	1325.807	1860.549	11410.239	0.0	0.0	0.0	0.0
37	2133.500	267.153	546.589	2217.654	1986.459	20946.513	12306.304	2185.525	103.131	117.491

TABLE 2 (continued)

2. THE REST OF ARKANSAS AND OKLAHOMA ($000,000)

FOR YEAR 1972

	41	42	43	44
1	0.0	0.0	2.284	89.512
2	0.043	2.972	24.140	64.450
3	0.041	0.064	15.289	636.821
4	0.364	0.0	0.482	12.609
5	-13.777	0.486	-9.884	377.182
6	-3.099	0.0	-2.651	35.038
7	-6.232	0.587	79.444	338.365
8	5.824	29.200	1362.311	2053.114
9	6.251	0.867	492.592	763.599
10	0.907	0.009	11.298	293.062
11	3.472	4.471	143.843	151.614
12	3.357	4.577	55.725	283.539
13	7.767	22.282	122.744	186.305
14	21.882	1.592	258.087	682.816
15	17.054	38.327	318.731	534.647
16	5.648	9.223	103.631	239.408
17	0.207	0.018	86.926	107.099
18	0.873	4.484	31.584	194.367
19	4.817	0.125	6.482	357.810
20	8.634	2.447	66.562	379.171
21	29.823	8.223	355.456	578.594
22	130.166	10.067	442.873	612.065
23	136.558	8.178	905.600	1007.764
24	122.295	0.854	320.105	385.425
25	0.973	0.058	2.982	44.013
26	0.0	0.0	8.898	262.519
27	-0.689	0.015	-0.120	53.705
28	113.014	931.525	2444.031	2693.902
29	53.348	33.219	437.828	890.449
30	23.395	23.049	2707.697	3285.678
31	24.578	66.706	2460.622	3631.015
32	17.599	34.231	301.548	428.874
33	12.855	64.299	464.128	844.389
34	134.929	187.970	3010.878	4029.234
35	950.651	2485.569	3509.657	3569.823
36	0.0	0.0	0.0	11410.239
37	1873.558	3975.694	20561.703	41508.216

TABLE 2 (continued)

3. REST OF U.S.A. ($000,000)

FOR YEAR 1972

	1	2	3	4	5	6	7	8	9	10
1	0.0	0.0	93.059	0.439	104.865	5.244	0.666	5239.299	0.0	0.0
2	0.0	0.0	0.0	1.318	30.029	6.460	189.632	2438.356	0.0	0.0
3	0.0	0.0	10866.666	21.870	550.731	64.797	34.947	17969.454	117.814	0.0
4	0.0	0.0	0.0	23.275	0.0	0.0	0.0	221.175	1082.038	0.0
5	1790.828	608.001	7284.213	0.0	538.685	0.0	12.800	3249.930	0.0	0.0
6	0.0	0.0	4.552	0.0	0.0	251.599	0.0	2678.124	0.0	0.0
7	182.726	465.266	492.571	343.415	323.899	95.322	893.760	4873.398	79.147	1673.746
8	1002.610	1555.477	2444.392	0.087	0.379	0.188	73.380	23278.708	69.188	4.946
9	11.540	0.178	0.774	0.0	48.054	0.188	161.024	95.951	24452.993	26.461
10	2.575	0.443	3.099	0.176	1.900	0.561	129.806	97.750	93.855	6344.003
11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.536
12	1.144	59.311	1.066	0.0	2.768	0.093	138.467	3547.480	655.827	94.418
13	1.334	0.887	6.010	0.439	3.315	0.937	16.183	717.406	46.057	4.270
14	48.924	31.473	76.728	279.827	1469.331	241.581	984.336	784.745	4494.834	333.819
15	34.237	21.100	118.898	41.895	508.741	100.471	296.948	286.963	126.013	262.161
16	28.324	7.803	93.863	11.682	107.317	25.750	66.183	1192.389	469.891	127.109
17	0.0	0.0	15.600	0.0	0.0	0.0	3.400	0.678	170.059	3.073
18	2.766	0.0	0.098	0.176	2.936	0.093	17.368	1738.754	114.309	239.392
19	0.858	0.710	4.360	0.176	2.558	0.843	0.866	48.599	15.395	95.617
20	20.600	4.255	34.240	2.108	34.966	5.056	122.423	3943.564	34.842	823.954
21	37.862	11.436	128.621	18.445	160.776	42.604	132.830	210.136	284.214	155.932
22	2.861	0.975	9.202	1.844	17.345	4.495	17.525	7.413	35.792	22.304
23	4.482	1.064	13.173	1.229	7.868	2.435	93.328	13.945	2.669	38.148
24	0.573	0.354	3.003	0.176	1.516	0.467	23.658	23.791	530.253	27.893
25	0.0	0.0	0.0	0.0	0.0	0.0	0.745	37.152	15.168	37.699
26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
27	0.477	0.0	0.0	6.500	94.071	6.086	20.643	13.285	0.494	0.0
28	49.305	19.263	147.065	15.985	161.059	37.080	128.039	236.401	77.028	77.003
29	267.507	64.631	295.317	26.437	284.802	31.929	287.565	3303.722	971.498	705.496
30	162.126	205.061	1014.511	71.055	612.052	90.733	759.341	5090.625	2268.906	903.881
31	322.439	93.274	1096.803	357.556	2313.881	556.484	845.423	1156.971	882.047	332.108
32	19.264	10.107	82.077	4.831	44.829	12.079	52.196	189.623	204.337	41.256
33	58.938	33.157	249.925	25.471	158.065	5.244	83.465	895.822	533.059	226.861
34	75.817	127.132	314.853	35.396	330.330	86.145	613.489	4689.032	1657.593	607.917
35	0.954	0.532	4.263	0.263	2.274	0.655	8.932	132.248	108.873	18.938
36	3133.536	463.339	5648.649	546.221	9144.885	2817.428	9462.388	36468.970	18534.461	8043.546
37	7264.657	3784.929	30547.651	1838.292	17064.227	4493.047	15671.756	124871.859	58148.654	21273.477

TABLE 2 (continued)

3. REST OF U.S.A. ($000,000)

FOR YEAR 1972

	11	12	13	14	15	16	17	18	19	20
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	0.0	0.0	0.0	4.345	0.0	0.0	0.0	0.0	0.0	0.0
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.099	0.0	0.0
5	0.0	14.896	0.0	21.022	0.0	0.0	0.0	0.0	0.0	0.0
6	0.0	0.0	0.0	20.556	0.0	0.0	0.0	0.0	0.0	0.0
7	3.387	7.860	5.729	65.182	2.018	6.041	0.100	10.110	15.434	21.327
8	34.203	165.960	21.062	565.378	42.129	7.812	452.410	12.531	13.780	14.259
9	747.143	289.375	63.568	46.059	11.834	1038.723	367.320	67.523	63.254	67.200
10	1262.111	1619.620	0.0	60.247	5.592	71.649	40.122	197.735	294.412	227.178
11	77.208	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.626	0.0
12	180.040	7081.760	4337.496	1145.086	194.572	476.871	100.364	587.724	124.206	412.687
13	12.365	24.564	2924.745	124.937	3.172	12.489	2.778	15.731	44.400	238.573
14	123.931	1206.325	436.449	11987.173	899.577	3818.306	157.896	539.539	1304.413	735.132
15	28.690	270.678	55.347	512.380	2240.461	61.638	14.337	165.039	296.847	138.364
16	583.790	413.131	181.494	1118.385	51.466	887.160	297.148	314.722	223.679	521.927
17	17.474	0.971	5.052	7.028	0.865	1.947	967.118	0.392	2.075	0.393
18	132.987	50.696	24.744	378.469	89.473	132.243	4.860	2200.157	340.247	303.129
19	530.401	73.211	63.099	418.370	57.131	168.939	20.921	148.384	18505.294	12879.423
20	711.512	141.047	46.654	1103.120	319.016	358.122	79.930	197.079	983.501	2466.838
21	30.750	162.126	99.406	491.013	49.326	198.543	28.805	146.457	1697.756	1018.681
22	12.713	2.734	5.336	18.914	3.365	22.018	3.921	48.747	514.648	234.995
23	1.262	1.266	2.963	2.184	2.018	21.624	0.200	5.392	28.098	43.801
24	36.809	37.004	298.428	91.079	22.921	59.332	63.473	65.155	112.706	106.461
25	4.783	108.979	0.296	156.061	33.980	9.951	0.898	93.070	804.846	15.682
26	0.0	0.0	0.0	68.460	14409.433	0.0	0.0	0.0	0.0	0.0
27	0.0	85.654	0.0	645.529	83.129	31.852	0.996	1043.074	3950.236	21.708
28	23.360	238.389	104.048	388.335	522.423	103.137	7.751	156.129	574.224	137.192
29	324.996	1357.722	984.592	1998.724	1703.757	745.000	105.332	1634.805	2777.454	1235.743
30	532.532	1109.085	779.772	1533.535	286.201	550.470	218.886	561.089	2434.138	1437.217
31	256.978	542.863	1509.080	1653.661	474.043	354.697	99.491	449.035	586.977	890.671
32	35.901	76.215	319.357	203.527	55.279	81.861	17.279	70.252	130.670	147.007
33	87.886	643.970	178.509	1524.749	613.709	316.309	31.176	715.688	1914.804	481.509
34	422.857	952.287	2369.926	5490.945	760.070	956.736	192.769	790.753	1601.330	1570.864
35	15.177	49.997	416.645	108.324	35.288	21.685	20.328	26.615	96.179	46.315
36	4487.682	10425.116	14177.835	22297.638	7365.881	9651.404	2146.555	10064.392	20693.878	19528.841
37	10718.120	27153.501	29411.632	54250.415	30338.129	20166.559	5443.164	20427.418	60146.112	44943.117

TABLE 2 (continued)

3. REST OF U.S.A. ($000,000)

FOR YEAR 1972

	21	22	23	24	25	26	27	28	29	30
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.751	0.0
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	0.0	0.0	0.0	0.777	0.0	0.0	0.0	0.0	0.0	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	22.449	0.0	0.0
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	6.675	7.834	8.398	24.780	0.0	0.371	0.0	237.094	12.174	118.627
8	40.876	35.105	39.586	64.623	0.399	4.541	1.263	48.836	183.238	138.596
9	79.572	90.747	1595.014	425.163	15.319	2.040	3.212	791.528	140.641	141.842
10	154.590	119.723	900.318	484.659	37.800	0.0	13.900	9579.172	7.281	34.821
11	1.479	319.622	378.115	0.0	0.0	0.0	0.0	417.081	0.0	0.0
12	249.284	475.400	185.459	752.013	13.329	1.762	13.908	435.886	108.504	1491.602
13	46.908	117.247	68.616	29.580	0.795	1.947	1.802	34.855	140.609	396.114
14	274.593	774.690	579.802	842.266	56.004	107.892	154.977	2037.356	110.553	114.299
15	318.470	123.032	207.111	144.309	78.982	60.808	131.746	3086.557	2688.123	1522.488
16	856.005	1007.732	2053.862	844.520	47.648	4.078	89.888	1490.108	473.028	463.396
17	2.744	2.349	3.858	61.418	0.0	0.556	0.0	4.332	1.775	14.360
18	310.940	693.635	1111.146	181.629	26.659	7.415	21.721	10551.180	35.364	71.116
19	8095.146	4594.490	8120.515	2472.529	68.637	108.819	195.677	5319.453	247.824	4.919
20	2237.207	1909.516	7897.998	833.252	87.438	91.302	83.812	15314.427	200.903	60.199
21	6456.943	783.107	3644.499	279.770	293.847	290.040	310.728	3550.208	326.719	188.564
22	2995.929	8578.079	3687.654	939.073	15.210	122.080	17.546	4034.144	250.109	80.660
23	245.557	3.026	18286.639	418.327	1.194	4.913	50.580	55.139	1491.381	80.561
24	260.035	343.525	432.902	1771.905	4.874	13.532	15.369	868.819	85.044	144.104
25	11.572	6.905	30.453	13.810	660.806	0.0	7.921	0.0	0.988	0.0
26	0.0	0.0	0.0	0.0	0.0	553.379	0.0	0.0	33.707	0.0
27	2.929	4.636	0.298	13.870	1.592	0.834	395.044	1386.822	0.0	0.0
28	150.213	122.900	182.762	120.057	45.569	681.855	77.865	46.276	2289.934	851.936
29	924.169	825.545	1658.319	658.553	53.019	100.015	103.923	4194.242	8953.232	2721.357
30	2138.758	1513.497	4287.746	1059.470	168.012	85.648	191.773	12612.066	1843.886	2971.400
31	1351.403	1142.572	678.003	745.216	261.716	2622.394	539.596	2027.018	3055.970	11759.008
32	303.655	277.537	198.051	194.039	5.172	43.105	6.823	471.333	886.215	3019.403
33	479.956	420.318	496.987	260.748	110.715	218.387	332.313	216.221	602.230	3237.378
34	2331.798	3126.405	3550.356	2265.237	182.237	505.554	279.350	9615.012	5118.613	16680.342
35	87.582	89.175	112.097	83.574	4.676	15.664	17.024	59.963	213.820	1151.458
36	30392.377	24817.560	33762.128	16287.892	3172.373	10944.374	3903.341	74935.221	44199.702	163386.816
37	62816.365	52330.929	94158.692	32273.059	5414.021	16593.305	6961.102	163442.798	73705.318	212845.366

TABLE 2 (continued)

3. REST OF U.S.A. ($000,000)

FOR YEAR 1972

	31	32	33	34	35	36	37	38	39	40
1	0.0	0.0	0.0	0.0	0.0	5443.572	117.712	0.0	0.0	0.0
2	0.0	0.0	0.0	315.932	0.0	2985.478	1115.162	0.0	-19.278	15.300
3	0.0	0.0	0.0	52.313	0.0	29682.937	179.580	0.0	444.938	-162.900
4	0.0	0.0	0.0	0.0	16.288	1343.652	0.0	0.0	288.566	389.300
5	19.936	0.0	0.0	344.127	117.954	14024.841	158.675	0.0	1316.990	2414.600
6	0.0	0.0	0.0	0.0	48.379	3003.210	17.998	0.0	314.854	1577.600
7	716.035	92.669	85.624	1121.451	17.173	12009.343	5237.199	0.0	147.819	-1271.928
8	91.784	9.552	6.955	16613.868	57.405	47095.506	77336.235	0.0	1463.462	-1227.400
9	46.433	14.772	9.796	1281.906	69.378	32266.525	26770.789	594.141	1370.959	-3302.500
10	0.393	0.0	0.0	70.875	0.0	21856.366	368.990	4.763	633.175	-1223.500
11	0.0	0.0	0.0	0.0	0.0	1211.667	5794.180	3009.548	431.172	-282.600
12	348.695	26.983	25.570	1222.662	39.842	24532.269	2422.743	0.0	239.315	-802.000
13	1286.169	113.544	67.891	1662.579	109.906	8279.154	5590.285	0.0	260.450	134.600
14	75.609	0.886	115.504	2817.500	314.312	38430.582	11559.214	164.200	782.329	1832.600
15	594.591	18.119	1342.758	1352.922	305.777	17557.201	13103.212	0.0	38.635	-2160.900
16	269.449	10.142	48.397	1656.311	37.584	16075.351	4237.562	42.823	524.918	-572.800
17	9.717	1.281	0.784	180.783	2.845	1482.927	4792.654	0.0	249.849	-1114.000
18	5.301	1.084	4.996	656.530	12.757	19464.410	1152.444	0.0	453.246	-510.800
19	1.179	19.498	15.185	51.156	8.831	62359.013	31.740	66.100	758.059	-4473.500
20	14.301	0.099	5.389	1203.163	31.794	41403.627	1689.183	1863.171	1175.613	306.600
21	53.775	3.840	125.104	1995.503	62.312	25481.678	1101.128	27261.387	1493.177	4676.900
22	59.095	744.492	103.748	1380.553	68.496	24064.024	11595.807	9042.163	1280.794	-1144.300
23	29.551	15.068	11.854	5864.737	91.164	26936.840	31516.572	24068.615	1514.766	-2858.500
24	144.795	33.581	33.505	3023.238	27.477	8707.727	9588.245	4942.107	788.110	-489.500
25	1.471	0.0	2262.192	28.175	314.706	4658.309	122.139	0.0	81.079	495.100
26	0.0	0.0	3612.297	0.0	0.0	18677.276	0.0	53.400	64.914	-2762.200
27	0.0	0.0	0.0	0.0	4.319	7814.078	7.494	198.600	49.907	-1004.300
28	11010.243	995.610	1754.714	2603.285	2727.055	26871.480	0.0	96225.034	0.0	15.800
29	509.306	145.647	462.705	3602.022	1350.866	45459.939	20145.061	1184.746	526.829	4026.039
30	888.305	81.244	416.466	7243.203	188.314	56331.004	136586.930	9978.607	984.269	6932.948
31	32624.434	1321.865	1017.895	17231.407	730.683	91883.362	144213.107	4286.276	0.0	2097.982
32	2058.932	568.020	210.927	2930.894	126.392	13098.445	12549.187	2095.287	0.0	380.691
33	1546.899	275.836	11154.509	3784.311	1739.272	33654.398	20955.094	0.0	0.0	-255.500
34	11834.639	2942.219	1294.068	25009.241	1063.149	111444.451	154638.724	191.500	-164.000	1269.550
35	2044.196	168.002	172.621	1588.596	51.518	6974.451	4045.916	0.0	0.0	137.535
36	192223.438	27925.125	24767.245	158900.469	143868.682	1158589.458	0.0	0.0	0.0	0.0
37	248604.661	35529.178	49128.699	265789.712	153604.630	2061154.551	708740.961	185272.468	17494.916	1084.013

TABLE 2 (continued)

3. REST OF U.S.A. ($000,000)

FOR YEAR 1972

	41	42	43	44
1	0.0	0.0	117.712	5561.284
2	2.137	65.423	1178.744	4164.222
3	2.039	1.406	465.063	30148.000
4	21.163	0.0	699.029	2042.681
5	-800.209	16.184	3106.240	17131.081
6	-180.035	0.0	1730.417	4733.627
7	-508.021	226.535	3831.604	15840.947
8	300.922	2184.894	80058.113	127153.619
9	308.778	190.323	25932.490	58199.015
10	42.064	26.586	-147.922	21708.444
11	190.286	456.115	9588.701	10800.368
12	151.955	542.759	2554.772	27087.041
13	375.761	1799.883	8161.979	16441.133
14	1245.672	1475.555	17059.570	55490.152
15	754.383	684.851	12420.181	29977.382
16	243.382	195.316	4671.201	20746.552
17	9.095	8.674	3946.272	5429.199
18	48.314	132.996	1272.200	20736.610
19	249.906	6.716	-3360.979	58998.034
20	455.684	110.197	5600.448	47004.075
21	1688.376	950.989	37171.957	62653.635
22	6668.582	481.373	27924.426	51988.450
23	10809.561	1283.655	65534.669	92471.509
24	6643.596	1092.342	22564.900	31272.627
25	46.067	22.215	766.600	5424.909
26	0.0	0.0	-2643.886	16033.390
27	-34.786	0.378	-782.707	7031.371
28	6304.550	32057.029	134602.413	161473.893
29	2683.327	1763.075	30329.077	75789.016
30	1095.743	1547.653	157126.146	213457.150
31	1107.500	3722.554	155427.419	247310.781
32	825.280	1119.694	16970.129	30068.574
33	621.567	2349.799	23670.960	57325.358
34	6780.673	9731.754	172448.201	283892.652
35	48372.260	79551.199	132106.910	139081.361
36	0.0	0.0	0.0	1158589.458
37	95712.579	143798.112	1152103.049	3213257.600

Footnote to TABLE 2

1. Rowwise 36 indicates values added and 37 indicates total output.

2. Columnwise 36 through 44 indicate the following:

    36: Intermediate Total

    37: Personal Consumption Expenditure

    38: Gross Private Domestic Fixed Investment

    39: Change in Business Inventories

    40: Net Exports

    41: Federal Government Purchases

    42: State and Local Government Purchases

    43: Final Demand

    44: Total Output

TABLE 3

TRADE COEFFICIENTS IN 1972

1 : DAIRY FARM PROD

	WATER	NO WATER	REST USA
WATER	0.072887	0.060954	0.004041
NO WATER	0.308002	0.297753	0.021148
REST USA	0.619111	0.641293	0.974811

2 : POULTRY AND EGG

	WATER	NO WATER	REST USA
WATER	0.156243	0.148478	0.019508
NO WATER	0.552913	0.549061	0.075538
REST USA	0.290844	0.302461	0.904954

3 : MEAT ANIMAL PROD

	WATER	NO WATER	REST USA
WATER	0.059447	0.054020	0.003469
NO WATER	0.289210	0.280169	0.018983
REST USA	0.651344	0.665811	0.977548

4 : COTTON

	WATER	NO WATER	REST USA
WATER	0.191142	0.116879	0.019556
NO WATER	0.720776	0.789055	0.094425
REST USA	0.088082	0.094066	0.886019

TABLE 3

TRADE COEFFICIENTS IN 1972

5 : FOOD,FEED,GRAIN

	WATER	NO WATER	REST USA
WATER	0.171043	0.090754	0.004958
NO WATER	0.502023	0.568519	0.020091
REST USA	0.326934	0.340727	0.974951

6 : OILBEARING CROP

	WATER	NO WATER	REST USA
WATER	0.155043	0.153990	0.010279
NO WATER	0.654370	0.654608	0.042390
REST USA	0.190587	0.191402	0.947331

7 : FORESTRY,FISHERY

	WATER	NO WATER	REST USA
WATER	0.175465	0.165883	0.0
NO WATER	0.824535	0.834117	0.0
REST USA	0.0	0.0	1.000000

8 : FOOD,KINDRED PROD

	WATER	NO WATER	REST USA
WATER	0.276223	0.207795	0.004254
NO WATER	0.255670	0.258222	0.004689
REST USA	0.468107	0.533984	0.991058

TABLE 3

TRADE COEFFICIENTS IN 1972

9 : APPAREL & TEXTILE

	WATER	NO WATER	REST USA
WATER	0.102890	0.085264	0.001318
NO WATER	0.225762	0.189916	0.003501
REST USA	0.671348	0.724821	0.995182

10 : LUMBER,WOOD PROD

	WATER	NO WATER	REST USA
WATER	0.193595	0.156441	0.002984
NO WATER	0.686475	0.578687	0.011945
REST USA	0.119930	0.264872	0.985071

11 : FURNITURE,FIXTURE

	WATER	NO WATER	REST USA
WATER	0.120026	0.115072	0.014644
NO WATER	0.067540	0.066600	0.007951
REST USA	0.812434	0.818327	0.977405

12 : PAPER & ALLIED

	WATER	NO WATER	REST USA
WATER	0.128840	0.106894	0.012303
NO WATER	0.080215	0.077992	0.008261
REST USA	0.790945	0.815113	0.979345

TABLE 3

TRADE COEFFICIENTS IN 1972

13 : PRINTING,PUBLISH

	WATER	NO WATER	REST USA
WATER	0.509210	0.426639	0.001538
NO WATER	0.384071	0.469258	0.001059
REST USA	0.106719	0.104103	0.997403

14 : CHEMICAL & ALLIED

	WATER	NO WATER	REST USA
WATER	0.023553	0.017590	0.000349
NO WATER	0.128891	0.121234	0.002658
REST USA	0.847556	0.861176	0.996993

15 : PETROLEUM,ALLIED

	WATER	NO WATER	REST USA
WATER	0.604179	0.356699	0.011776
NO WATER	0.195155	0.214768	0.005384
REST USA	0.200666	0.428534	0.982840

16 : RUBBER, PLASTIC

	WATER	NO WATER	REST USA
WATER	0.141587	0.135034	0.008301
NO WATER	0.150396	0.153532	0.009666
REST USA	0.708017	0.711434	0.982034

TABLE 3

TRADE COEFFICIENTS IN 1972

17 : LEATHER

	WATER	NO WATER	REST USA
WATER	0.032244	0.033877	0.004327
NO WATER	0.129871	0.138462	0.018006
REST USA	0.837885	0.827661	0.977668

18 : STONE,CLAY,GLASS

	WATER	NO WATER	REST USA
WATER	0.327641	0.305222	0.004807
NO WATER	0.267676	0.332390	0.004419
REST USA	0.404683	0.362388	0.990774

19 : PRIMARY METAL

	WATER	NO WATER	REST USA
WATER	0.099821	0.060652	0.003244
NO WATER	0.042251	0.133867	0.003072
REST USA	0.857929	0.805481	0.993684

20 : FABRICATED METAL

	WATER	NO WATER	REST USA
WATER	0.351216	0.355481	0.005264
NO WATER	0.137247	0.145465	0.002056
REST USA	0.511537	0.499054	0.992678

TABLE 3

TRADE COEFFICIENTS IN 1972

21 : MACHINERY

	WATER	NO WATER	REST USA
WATER	0.188399	0.178250	0.005987
NO WATER	0.130335	0.128497	0.004796
REST USA	0.681266	0.693253	0.989217

22 : ELECTRICAL EQUIP

	WATER	NO WATER	REST USA
WATER	0.211337	0.125433	0.009088
NO WATER	0.065174	0.074332	0.004144
REST USA	0.723488	0.800235	0.986768

23 : MOTOR VEHICLE

	WATER	NO WATER	REST USA
WATER	0.135390	0.173339	0.003717
NO WATER	0.044304	0.065330	0.001261
REST USA	0.820306	0.761330	0.995022

24 : MISC. MANUFACTURE

	WATER	NO WATER	REST USA
WATER	0.194186	0.183343	0.003270
NO WATER	0.100221	0.107823	0.001801
REST USA	0.705593	0.708835	0.994929

TABLE 3

TRADE COEFFICIENTS IN 1972

25 : BITUMINOUS COAL

	WATER	NO WATER	REST USA
WATER	0.191024	0.140149	0.001904
NO WATER	0.028814	0.034651	0.000442
REST USA	0.780163	0.825200	0.997654

26 : PETROLEUM, NAT. GAS

	WATER	NO WATER	REST USA
WATER	0.097258	0.094338	0.003966
NO WATER	0.730064	0.746647	0.033326
REST USA	0.172678	0.159016	0.962707

27 : OTHER MINING

	WATER	NO WATER	REST USA
WATER	0.098956	0.096220	0.002121
NO WATER	0.493721	0.501279	0.013302
REST USA	0.407323	0.402502	0.984576

28 : CONSTRUCTION

	WATER	NO WATER	REST USA
WATER	0.521785	0.415419	0.0
NO WATER	0.478215	0.584581	0.0
REST USA	0.0	0.0	1.000000

TABLE 3

TRADE COEFFICIENTS IN 1972

29 : TRANSPORTATION

	WATER	NO WATER	REST USA
WATER	0.444606	0.219220	0.0
NO WATER	0.555394	0.780780	0.0
REST USA	0.0	0.0	1.000000

30 : WHOLE SALE,RETAIL

	WATER	NO WATER	REST USA
WATER	0.452775	0.409690	0.0
NO WATER	0.547225	0.590310	0.0
REST USA	0.0	0.0	1.000000

31 : FINANCE,INSURANCE

	WATER	NO WATER	REST USA
WATER	0.341506	0.286305	0.0
NO WATER	0.324844	0.407116	0.0
REST USA	0.333649	0.306579	1.000000

32 : COMMUNICATION

	WATER	NO WATER	REST USA
WATER	0.598161	0.457547	0.0
NO WATER	0.401839	0.542453	0.0
REST USA	0.0	0.0	1.000000

TABLE 3

TRADE COEFFICIENTS IN 1972

33 : ELEC,GAS,SANITARY

	WATER	NO WATER	REST USA
WATER	0.477265	0.454790	0.0
NO WATER	0.522735	0.545210	0.0
REST USA	0.0	0.0	1.000000

34 : HOTEL,OTHER SERV.

	WATER	NO WATER	REST USA
WATER	0.275448	0.268328	0.0
NO WATER	0.315837	0.362752	0.0
REST USA	0.408715	0.368920	1.000000

35 : GOVERNMENT

	WATER	NO WATER	REST USA
WATER	0.329184	0.317179	0.0
NO WATER	0.670816	0.682821	0.0
REST USA	0.0	0.0	1.000000

TABLE 4

DEMAND ADJUSTED SIMULATION
DEVELOPMENT IMPACT OF THE WATERWAY
FOR YEAR 1974

REGION : WATER
Counties

(UNIT:MILLION DOLLARS)

INDUSTRY	OUTPUT WITH WATER WAY (A)	OUTPUT W/O WATER WAY (B)	DIFFERENCE (A)-(B)	PERCENTAGE -(C/B)*100
1.DAIRY FARM PROD	61.272	61.215	0.057	0.09%
2.POULTRY AND EGG	177.484	177.335	0.149	0.08%
3.MEAT ANIMAL PROD	165.220	165.072	0.148	0.09%
4.COTTON	34.269	34.077	0.192	0.56%
5.FOOD,FEED,GRAIN	431.585	430.780	0.805	0.19%
6.OILBEARING CROP	192.565	192.014	0.552	0.29%
7.FORESTRY,FISHERY	64.690	64.172	0.517	0.81%
8.FOOD,KINDRED PROD	1952.919	1952.647	0.272	0.01%
9.APPAREL & TEXTILE	234.921	234.851	0.070	0.03%
10.LUMBER,WOOD PROD	175.204	175.005	0.199	0.11%
11.FURNITURE,FIXTURE	212.722	212.706	0.017	0.01%
12.PAPER & ALLIED	587.257	586.521	0.737	0.13%
13.PRINTING,PUBLISH	244.090	244.073	0.018	0.01%
14.CHEMICAL & ALLIED	65.454	64.217	1.237	1.93%
15.PETROLEUM,ALLIED	1496.254	1494.810	1.444	0.10%
16.RUBBER, PLASTIC	334.073	332.860	1.213	0.36%
17.LEATHER	32.181	32.177	0.004	0.01%
18.STONE,CLAY,GLASS	222.364	221.534	0.830	0.37%
19.PRIMARY METAL	436.187	435.059	1.128	0.26%
20.FABRICATED METAL	744.736	744.290	0.446	0.06%
21.MACHINERY	830.077	829.828	0.250	0.03%
22.ELECTRICAL EQUIP	914.161	914.003	0.158	0.02%
23.MOTOR VEHICLE	925.660	925.545	0.114	0.01%
24.MISC.MANUFACTURE	313.005	312.932	0.073	0.02%
25.BITUMINOUS COAL	34.593	34.011	0.583	1.71%
26.PETROLEUM,NAT.GAS	244.108	244.103	0.005	0.00%
27.OTHER MINING	22.231	14.760	7.470	50.61%
28.CONSTRUCTION	1739.439	1739.179	0.259	0.01%
29.TRANSPORTATION	470.376	470.464	-0.088	-0.02%
30.WHOLE SALE,RETAIL	1926.747	1927.018	-0.271	-0.01%
31.FINANCE,INSURANCE	1985.720	1986.043	-0.322	-0.02%
32.COMMUNICATION	379.189	379.244	-0.055	-0.01%
33.ELEC,GAS,SANITARY	570.197	569.982	0.215	0.04%
34.HOTEL,OTHER SERV.	2196.851	2196.765	0.086	0.00%
35 GOVERNMENT	1120.874	1120.884	-0.010	-0.00%
TOTAL	21538.68	21520.17	18.50	0.09%

TABLE 4

DEMAND ADJUSTED SIMULATION
DEVELOPMENT IMPACT OF THE WATERWAY
FOR YEAR 1974

REGION : The Rest of
Arkansas and Oklahoma

(UNIT:MILLION DOLLARS)

INDUSTRY	OUTPUT WITH WATER WAY (A)	OUTPUT W/O WATER WAY (B)	DIFFERENCE (A)-(B)	PERCENTAGE -(C/B)*100
1.DAIRY FARM PROD	303.447	303.136	0.311	0.10%
2.POULTRY AND EGG	679.280	678.700	0.580	0.09%
3.MEAT ANIMAL PROD	892.258	891.447	0.811	0.09%
4.COTTON	194.400	193.410	0.990	0.51%
5.FOOD,FEED,GRAIN	1928.642	1925.730	2.912	0.15%
6.OILBEARING CROP	790.814	790.299	0.515	0.07%
7.FORESTRY,FISHERY	311.139	308.261	2.878	0.93%
8.FOOD,KINDRED PROD	2122.850	2122.558	0.292	0.01%
9.APPAREL & TEXTILE	577.382	577.140	0.241	0.04%
10.LUMBER,WOOD PROD	625.504	624.689	0.816	0.13%
11.FURNITURE,FIXTURE	116.868	116.859	0.009	0.01%
12.PAPER & ALLIED	408.133	407.575	0.558	0.14%
13.PRINTING,PUBLISH	211.813	211.798	0.015	0.01%
14.CHEMICAL & ALLIED	472.536	470.366	2.170	0.46%
15.PETROLEUM,ALLIED	550.053	548.583	1.471	0.27%
16.RUBBER, PLASTIC	396.698	395.245	1.453	0.37%
17.LEATHER	130.658	130.642	0.016	0.01%
18.STONE,CLAY,GLASS	201.659	200.723	0.936	0.47%
19.PRIMARY METAL	374.815	373.155	1.660	0.44%
20.FABRICATED METAL	298.555	298.420	0.136	0.05%
21.MACHINERY	623.829	623.655	0.174	0.03%
22.ELECTRICAL EQUIP	375.375	375.298	0.077	0.02%
23.MOTOR VEHICLE	321.120	321.087	0.033	0.01%
24.MISC.MANUFACTURE	170.353	170.323	0.031	0.02%
25.BITUMINOUS COAL	6.422	6.380	0.042	0.66%
26.PETROLEUM,NAT.GAS	1961.224	1961.080	0.143	0.01%
27.OTHER MINING	150.750	149.922	0.828	0.55%
28.CONSTRUCTION	2021.893	2021.510	0.383	0.02%
29.TRANSPORTATION	920.786	920.807	-0.021	-0.00%
30.WHOLE SALE,RETAIL	2586.680	2587.004	-0.324	-0.01%
31.FINANCE,INSURANCE	2490.596	2491.063	-0.467	-0.02%
32.COMMUNICATION	356.584	356.640	-0.055	-0.02%
33.ELEC,GAS,SANITARY	657.512	657.161	0.352	0.05%
34.HOTEL,OTHER SERV.	2779.550	2779.424	0.126	0.00%
35 GOVERNMENT	2350.304	2350.323	-0.019	-0.00%
TOTAL	29360.49	29340.41	20.07	0.07%

TABLE 4

DEMAND ADJUSTED SIMULATION
DEVELOPMENT IMPACT OF THE WATERWAY
FOR YEAR 1974

REGION :REST USA

(UNIT:MILLION DOLLARS)

INDUSTRY	OUTPUT WITH WATER WAY (A)	OUTPUT W/O WATER WAY (B)	DIFFERENCE (A)-(B)	PERCENTAGE -(C/B)*100
1.DAIRY FARM PROD	9726.718	9726.844	-0.126	-0.00%
2.POULTRY AND EGG	5465.710	5465.687	0.023	0.00%
3.MEAT ANIMAL PROD	32735.397	32735.199	0.198	0.00%
4.COTTON	3077.403	3077.425	-0.022	-0.00%
5.FOOD,FEED,GRAIN	40874.056	40874.877	-0.821	-0.00%
6.OILBEARING CROP	10018.766	10018.850	-0.084	-0.00%
7.FORESTRY,FISHERY	22894.059	22894.311	-0.252	-0.00%
8.FOOD,KINDRED PROD	141420.055	141418.695	1.360	0.00%
9.APPAREL & TEXTILE	64625.026	64625.162	-0.136	-0.00%
10.LUMBER,WOOD PROD	25891.359	25891.343	0.016	0.00%
11.FURNITURE,FIXTURE	12470.146	12470.155	-0.009	-0.00%
12.PAPER & ALLIED	32677.047	32676.070	0.977	0.00%
13.PRINTING,PUBLISH	33492.009	33491.874	0.135	0.00%
14.CHEMICAL & ALLIED	65547.996	65511.704	36.292	0.06%
15.PETROLEUM,ALLIED	37529.352	37524.404	4.948	0.01%
16.RUBBER, PLASTIC	24627.537	24626.644	0.893	0.00%
17.LEATHER	5594.832	5594.836	-0.004	-0.00%
18.STONE,CLAY,GLASS	24287.285	24286.365	0.919	0.00%
19.PRIMARY METAL	81471.528	81464.520	7.008	0.01%
20.FABRICATED METAL	56143.009	56141.605	1.404	0.00%
21.MACHINERY	82881.472	82880.205	1.268	0.00%
22.ELECTRICAL EQUIP	64283.777	64283.799	-0.022	-0.00%
23.MOTOR VEHICLE	92789.880	92789.562	0.318	0.00%
24.MISC.MANUFACTURE	39173.964	39173.846	0.118	0.00%
25.BITUMINOUS COAL	8790.587	8790.236	0.351	0.00%
26.PETROLEUM,NAT.GAS	29860.449	29858.511	1.938	0.01%
27.OTHER MINING	9226.010	9219.790	6.220	0.07%
28.CONSTRUCTION	194519.365	194517.971	1.393	0.00%
29.TRANSPORTATION	88900.045	88898.608	1.436	0.00%
30.WHOLE SALE,RETAIL	261431.613	261431.555	0.057	0.00%
31.FINANCE,INSURANCE	280364.455	280363.582	0.873	0.00%
32.COMMUNICATION	45008.683	45008.583	0.099	0.00%
33.ELEC,GAS,SANITARY	61396.996	61394.990	2.006	0.00%
34.HOTEL,OTHER SERV.	327796.068	327792.206	3.861	0.00%
35 GOVERNMENT	181243.196	181243.135	0.061	0.00%
TOTAL	2498235.85	2498163.15	72.70	0.00%

TABLE 4

DEMAND ADJUSTED SIMULATION
DEVELOPMENT IMPACT OF THE WATERWAY
FOR YEAR 1975

REGION : WATER
Counties

(UNIT: MILLION DOLLARS)

INDUSTRY	OUTPUT WITH WATER WAY (A)	OUTPUT W/O WATER WAY (B)	DIFFERENCE (A)-(B)	PERCENTAGE -(C/B)*100
1.DAIRY FARM PROD	55.145	55.091	0.054	0.10%
2.POULTRY AND EGG	187.812	187.667	0.145	0.08%
3.MEAT ANIMAL PROD	173.683	173.543	0.140	0.08%
4.COTTON	67.941	67.757	0.184	0.27%
5.FOOD,FEED,GRAIN	375.425	374.586	0.839	0.22%
6.OILBEARING CROP	110.248	109.567	0.681	0.62%
7.FORESTRY,FISHERY	55.114	54.602	0.513	0.94%
8.FOOD,KINDRED PROD	2038.281	2038.010	0.271	0.01%
9.APPAREL & TEXTILE	225.598	225.531	0.066	0.03%
10.LUMBER,WOOD PROD	167.231	167.044	0.187	0.11%
11.FURNITURE,FIXTURE	179.432	179.414	0.017	0.01%
12.PAPER & ALLIED	594.193	593.486	0.708	0.12%
13.PRINTING,PUBLISH	254.837	254.820	0.017	0.01%
14.CHEMICAL & ALLIED	79.385	78.319	1.066	1.36%
15.PETROLEUM,ALLIED	1947.513	1946.128	1.385	0.07%
16.RUBBER, PLASTIC	370.052	368.832	1.220	0.33%
17.LEATHER	33.589	33.585	0.004	0.01%
18.STONE,CLAY,GLASS	254.125	253.526	0.599	0.24%
19.PRIMARY METAL	284.365	283.542	0.823	0.29%
20.FABRICATED METAL	819.614	818.840	0.775	0.09%
21.MACHINERY	955.979	955.739	0.240	0.03%
22.ELECTRICAL EQUIP	838.831	838.626	0.205	0.02%
23.MOTOR VEHICLE	823.661	823.496	0.166	0.02%
24.MISC.MANUFACTURE	314.778	314.694	0.084	0.03%
25.BITUMINOUS COAL	63.756	63.382	0.374	0.59%
26.PETROLEUM,NAT.GAS	262.208	262.245	-0.037	-0.01%
27.OTHER MINING	34.369	31.007	3.362	10.84%
28.CONSTRUCTION	1851.778	1851.562	0.216	0.01%
29.TRANSPORTATION	488.345	488.502	-0.157	-0.03%
30.WHOLE SALE,RETAIL	2271.089	2271.402	-0.312	-0.01%
31.FINANCE,INSURANCE	2190.876	2191.273	-0.397	-0.02%
32.COMMUNICATION	434.159	434.221	-0.062	-0.01%
33.ELEC,GAS,SANITARY	732.644	732.625	0.019	0.00%
34.HOTEL,OTHER SERV.	2520.549	2520.563	-0.014	-0.00%
35 GOVERNMENT	1262.206	1262.221	-0.015	-0.00%
TOTAL	23318.81	23305.45	13.36	0.06%

TABLE 4

DEMAND ADJUSTED SIMULATION
DEVELOPMENT IMPACT OF THE WATERWAY
FOR YEAR 1975

REGION : The Rest of Arkansas and Oklahoma

(UNIT: MILLION DOLLARS)

INDUSTRY	OUTPUT WITH WATER WAY (A)	OUTPUT W/O WATER WAY (B)	DIFFERENCE (A)-(B)	PERCENTAGE -(C/B)*100
1.DAIRY FARM PROD	267.733	267.459	0.275	0.10%
2.POULTRY AND EGG	717.604	717.067	0.537	0.07%
3.MEAT ANIMAL PROD	894.014	893.299	0.715	0.08%
4.COTTON	326.983	326.089	0.894	0.27%
5.FOOD,FEED,GRAIN	1751.735	1749.151	2.584	0.15%
6.OILBEARING CROP	455.595	455.121	0.474	0.10%
7.FORESTRY,FISHERY	273.008	270.385	2.623	0.97%
8.FOOD,KINDRED PROD	2226.732	2226.463	0.269	0.01%
9.APPAREL & TEXTILE	556.304	556.079	0.226	0.04%
10.LUMBER,WOOD PROD	597.602	596.948	0.653	0.11%
11.FURNITURE,FIXTURE	100.366	100.358	0.008	0.01%
12.PAPER & ALLIED	407.204	406.719	0.485	0.12%
13.PRINTING,PUBLISH	231.573	231.560	0.013	0.01%
14.CHEMICAL & ALLIED	588.134	586.125	2.009	0.34%
15.PETROLEUM,ALLIED	946.303	945.269	1.034	0.11%
16.RUBBER, PLASTIC	441.861	440.424	1.438	0.33%
17.LEATHER	135.532	135.517	0.014	0.01%
18.STONE,CLAY,GLASS	242.602	242.059	0.543	0.22%
19.PRIMARY METAL	259.556	258.487	1.068	0.41%
20.FABRICATED METAL	325.274	325.114	0.160	0.05%
21.MACHINERY	727.106	726.990	0.116	0.02%
22.ELECTRICAL EQUIP	387.511	387.435	0.076	0.02%
23.MOTOR VEHICLE	308.601	308.568	0.033	0.01%
24.MISC.MANUFACTURE	166.952	166.922	0.029	0.02%
25.BITUMINOUS COAL	12.436	12.410	0.026	0.21%
26.PETROLEUM,NAT.GAS	2095.146	2095.450	-0.304	-0.01%
27.OTHER MINING	205.053	204.631	0.422	0.21%
28.CONSTRUCTION	2133.270	2133.058	0.212	0.01%
29.TRANSPORTATION	969.065	969.523	-0.457	-0.05%
30.WHOLE SALE,RETAIL	3080.485	3080.934	-0.450	-0.01%
31.FINANCE,INSURANCE	2759.441	2760.000	-0.558	-0.02%
32.COMMUNICATION	403.242	403.302	-0.060	-0.01%
33.ELEC,GAS,SANITARY	839.086	839.119	-0.034	-0.00%
34.HOTEL,OTHER SERV.	3203.286	3203.328	-0.042	-0.00%
35 GOVERNMENT	2631.308	2631.340	-0.033	-0.00%
TOTAL	31667.70	31652.70	15.00	0.05%

TABLE 4

DEMAND ADJUSTED SIMULATION
DEVELOPMENT IMPACT OF THE WATERWAY
FOR YEAR 1975

REGION :REST USA

(UNIT:MILLION DOLLARS)

INDUSTRY	OUTPUT WITH WATER WAY (A)	OUTPUT W/C WATER WAY (B)	DIFFERENCE (A)-(B)	PERCENTAGE -(C/B)*100
1.DAIRY FARM PROD	10941.633	10941.734	-0.101	-0.00%
2.POULTRY AND EGG	6481.171	6481.145	0.026	0.00%
3.MEAT ANIMAL PROD	35756.905	35756.611	0.294	0.00%
4.COTTON	2423.875	2423.898	-0.024	-0.00%
5.FOOD,FEED,GRAIN	38568.300	38569.036	-0.736	-0.00%
6.OILBEARING CROP	7926.137	7926.191	-0.054	-0.00%
7.FORESTRY,FISHERY	25478.235	25478.449	-0.213	-0.00%
8.FOOD,KINDRED PROD	153083.574	153082.155	1.419	0.00%
9.APPAREL & TEXTILE	63425.637	63425.739	-0.102	-0.00%
10.LUMBER,WOOD PROD	27125.536	27125.394	0.143	0.00%
11.FURNITURE,FIXTURE	10971.514	10971.520	-0.005	-0.00%
12.PAPER & ALLIED	33177.277	33176.361	0.916	0.00%
13.PRINTING,PUBLISH	35018.426	35018.282	0.144	0.00%
14.CHEMICAL & ALLIED	68889.684	68852.094	37.590	0.05%
15.PETROLEUM,ALLIED	40665.217	40664.540	0.677	0.00%
16.RUBBER, PLASTIC	24075.321	24074.483	0.838	0.00%
17.LEATHER	5372.820	5372.822	-0.003	-0.00%
18.STONE,CLAY,GLASS	24202.495	24202.075	0.420	0.00%
19.PRIMARY METAL	74937.659	74931.123	6.536	0.01%
20.FABRICATED METAL	61063.831	61062.964	0.867	0.00%
21.MACHINERY	85355.942	85355.174	0.769	0.00%
22.ELECTRICAL EQUIP	61052.169	61052.241	-0.072	-0.00%
23.MOTOR VEHICLE	90229.163	90229.021	0.142	0.00%
24.MISC.MANUFACTURE	42779.758	42779.672	0.086	0.00%
25.BITUMINOUS COAL	11313.492	11313.160	0.332	0.00%
26.PETROLEUM,NAT.GAS	33286.660	33286.733	-0.073	-0.00%
27.OTHER MINING	10238.301	10234.530	3.771	0.04%
28.CONSTRUCTION	190920.839	190919.878	0.960	0.00%
29.TRANSPORTATION	90176.723	90175.197	1.527	0.00%
30.WHOLE SALE,RETAIL	280092.690	280092.193	0.496	0.00%
31.FINANCE,INSURANCE	300837.822	300837.281	0.541	0.00%
32.COMMUNICATION	50801.449	50801.318	0.132	0.00%
33.ELEC,GAS,SANITARY	66252.244	66250.372	1.872	0.00%
34.HOTEL,OTHER SERV.	363345.254	363341.281	3.973	0.00%
35 GOVERNMENT	199312.609	199312.537	0.072	0.00%
TOTAL	2625580.36	2625517.20	63.16	0.00%

TABLE 4

DEMAND ADJUSTED SIMULATION
DEVELOPMENT IMPACT OF THE WATERWAY
FOR YEAR 1976

REGION : WATER
Counties

(UNIT:MILLION DOLLARS)

INDUSTRY	OUTPUT WITH WATER WAY (A)	OUTPUT W/O WATER WAY (B)	DIFFERENCE (A)-(B)	PERCENTAGE -(C/B)*100
1.DAIRY FARM PROD	53.530	53.469	0.061	0.11%
2.POULTRY AND EGG	156.868	156.707	0.160	0.10%
3.MEAT ANIMAL PROD	162.072	161.916	0.156	0.10%
4.COTTON	48.986	48.773	0.213	0.44%
5.FOOD,FEED,GRAIN	311.144	310.190	0.954	0.31%
6.OILBEARING CROP	116.928	116.069	0.859	0.74%
7.FORESTRY,FISHERY	56.520	55.988	0.532	0.95%
8.FOOD,KINDRED PROD	2187.001	2186.677	0.324	0.01%
9.APPAREL & TEXTILE	278.164	278.088	0.076	0.03%
10.LUMBER,WOOD PROD	197.152	196.927	0.225	0.11%
11.FURNITURE,FIXTURE	234.473	234.453	0.020	0.01%
12.PAPER & ALLIED	711.885	711.081	0.805	0.11%
13.PRINTING,PUBLISH	277.048	277.026	0.022	0.01%
14.CHEMICAL & ALLIED	91.682	90.532	1.149	1.27%
15.PETROLEUM,ALLIED	2244.212	2241.919	2.294	0.10%
16.RUBBER, PLASTIC	450.922	449.546	1.376	0.31%
17.LEATHER	38.069	38.064	0.005	0.01%
18.STONE,CLAY,GLASS	320.367	319.772	0.595	0.19%
19.PRIMARY METAL	365.782	364.447	1.335	0.37%
20.FABRICATED METAL	914.976	914.079	0.897	0.10%
21.MACHINERY	1009.777	1009.487	0.290	0.03%
22.ELECTRICAL EQUIP	1020.701	1020.461	0.240	0.02%
23.MOTOR VEHICLE	1007.526	1007.324	0.202	0.02%
24.MISC.MANUFACTURE	291.773	291.677	0.096	0.03%
25.BITUMINOUS COAL	77.161	76.583	0.579	0.76%
26.PETROLEUM,NAT.GAS	325.131	325.115	0.016	0.00%
27.OTHER MINING	40.198	36.456	3.743	10.27%
28.CONSTRUCTION	1986.998	1986.713	0.285	0.01%
29.TRANSPORTATION	551.481	551.569	-0.089	-0.02%
30.WHOLE SALE,RETAIL	2444.085	2444.326	-0.241	-0.01%
31.FINANCE,INSURANCE	2465.370	2465.567	-0.197	-0.01%
32.COMMUNICATION	509.667	509.723	-0.056	-0.01%
33.ELEC,GAS,SANITARY	817.590	817.483	0.107	0.01%
34.HOTEL,OTHER SERV.	2759.054	2759.008	0.046	0.00%
35 GOVERNMENT	1401.219	1401.233	-0.014	-0.00%
TOTAL	25925.51	25908.44	17.06	0.07%

TABLE 4

DEMAND ADJUSTED SIMULATION
DEVELOPMENT IMPACT OF THE WATERWAY
FOR YEAR 1976

REGION : The Rest of Arkansas and Oklahoma (UNIT:MILLION DOLLARS)

INDUSTRY	OUTPUT WITH WATER WAY (A)	OUTPUT W/O WATER WAY (B)	DIFFERENCE (A)-(B)	PERCENTAGE -(C/B)*100
1.DAIRY FARM PROD	268.501	268.198	0.303	0.11%
2.POULTRY AND EGG	601.975	601.385	0.590	0.10%
3.MEAT ANIMAL PRCD	861.897	861.113	0.784	0.09%
4.COTTON	241.761	240.735	1.026	0.43%
5.FOOD,FEED,GRAIN	1328.464	1325.792	2.672	0.20%
6.OILBEARING CROP	482.717	482.178	0.539	0.11%
7.FORESTRY,FISHERY	279.821	277.148	2.672	0.96%
8.FOOD,KINDRED PROD	2344.010	2343.690	0.320	0.01%
9.APPAREL & TEXTILE	694.665	694.406	0.259	0.04%
10.LUMBER,WOOD PROD	698.273	697.518	0.756	0.11%
11.FURNITURE,FIXTURE	130.128	130.120	0.009	0.01%
12.PAPER & ALLIED	492.548	492.009	0.539	0.11%
13.PRINTING,PUBLISH	247.666	247.649	0.017	0.01%
14.CHEMICAL & ALLIED	682.455	680.294	2.161	0.32%
15.PETROLEUM,ALLIED	1045.585	1043.418	2.167	0.21%
16.RUBBER, PLASTIC	516.267	514.652	1.615	0.31%
17.LEATHER	153.561	153.544	0.016	0.01%
18.STONE,CLAY,GLASS	315.183	314.648	0.535	0.17%
19.PRIMARY METAL	365.258	364.255	1.002	0.28%
20.FABRICATED METAL	358.473	358.363	0.110	0.03%
21.MACHINERY	764.264	764.159	0.105	0.01%
22.ELECTRICAL EQUIP	515.621	515.547	0.074	0.01%
23.MOTOR VEHICLE	381.717	381.689	0.028	0.01%
24.MISC.MANUFACTURE	145.801	145.771	0.030	0.02%
25.BITUMINOUS COAL	15.069	15.029	0.040	0.26%
26.PETROLEUM,NAT.GAS	2595.065	2594.997	0.069	0.00%
27.OTHER MINING	241.293	240.860	0.434	0.18%
28.CONSTRUCTION	2237.542	2237.283	0.259	0.01%
29.TRANSPORTATION	1092.199	1092.590	-0.391	-0.04%
30.WHOLE SALE,RETAIL	3263.789	3264.164	-0.375	-0.01%
31.FINANCE,INSURANCE	3059.210	3059.523	-0.314	-0.01%
32.COMMUNICATION	471.025	471.079	-0.054	-0.01%
33.ELEC,GAS,SANITARY	938.597	938.580	0.017	0.00%
34.HOTEL,OTHER SERV.	3470.192	3470.173	0.018	0.00%
35 GOVERNMENT	2922.423	2922.454	-0.031	-0.00%
TOTAL	34223.02	34205.02	18.00	0.05%

TABLE 4

DEMAND ADJUSTED SIMULATION
DEVELOPMENT IMPACT OF THE WATERWAY
FOR YEAR 1976

REGION :REST USA

(UNIT:MILLION DOLLARS)

INDUSTRY	OUTPUT WITH WATER WAY (A)	OUTPUT W/O WATER WAY (B)	DIFFERENCE (A)-(B)	PERCENTAGE -(C/B)*100
1.DAIRY FARM PROD	11094.205	11094.280	-0.075	-0.00%
2.POULTRY AND EGG	5990.443	5990.404	0.039	0.00%
3.MEAT ANIMAL PROD	34442.624	34441.964	0.659	0.00%
4.COTTON	3472.260	3472.287	-0.027	-0.00%
5.FOOD,FEED,GRAIN	34160.946	34161.561	-0.615	-0.00%
6.OILBEARING CROP	8920.952	8921.007	-0.055	-0.00%
7.FORESTRY,FISHERY	25889.560	25889.792	-0.232	-0.00%
8.FOOD,KINDRED PROD	168831.416	168829.626	1.790	0.00%
9.APPAREL & TEXTILE	73198.354	73198.556	-0.202	-0.00%
10.LUMBER,WOOD PROD	32904.094	32903.955	0.140	0.00%
11.FURNITURE,FIXTURE	12625.444	12625.451	-0.006	-0.00%
12.PAPER & ALLIED	38654.068	38653.149	0.919	0.00%
13.PRINTING,PUBLISH	38621.919	38621.769	0.150	0.00%
14.CHEMICAL & ALLIED	77002.567	76963.067	39.501	0.05%
15.PETROLEUM,ALLIED	46036.711	46035.733	0.978	0.00%
16.RUBBER, PLASTIC	27993.448	27992.574	0.873	0.00%
17.LEATHER	6224.893	6224.897	-0.004	-0.00%
18.STONE,CLAY,GLASS	27115.569	27115.113	0.456	0.00%
19.PRIMARY METAL	84079.899	84073.650	6.249	0.01%
20.FABRICATED METAL	68678.298	68677.415	0.883	0.00%
21.MACHINERY	93857.801	93856.979	0.822	0.00%
22.ELECTRICAL EQUIP	68384.223	68384.317	-0.094	-0.00%
23.MOTOR VEHICLE	115675.537	115675.411	0.125	0.00%
24.MISC.MANUFACTURE	48272.338	48272.250	0.088	0.00%
25.BITUMINOUS COAL	13034.777	13034.407	0.369	0.00%
26.PETROLEUM,NAT.GAS	37246.223	37246.182	0.041	0.00%
27.OTHER MINING	11147.863	11144.155	3.708	0.03%
28.CONSTRUCTION	208102.569	208101.526	1.043	0.00%
29.TRANSPORTATION	100180.390	100178.837	1.554	0.00%
30.WHOLE SALE,RETAIL	311528.333	311527.935	0.397	0.00%
31.FINANCE,INSURANCE	340259.070	340258.315	0.755	0.00%
32.COMMUNICATION	56913.924	56913.802	0.122	0.00%
33.ELEC,GAS,SANITARY	73835.369	73833.358	2.011	0.00%
34.HOTEL,OTHER SERV.	401756.738	401752.587	4.151	0.00%
35 GOVERNMENT	213827.336	213827.269	0.067	0.00%
TOTAL	2919960.16	2919893.58	66.58	0.00%

TABLE 4

DEMAND ADJUSTED SIMULATION
DEVELOPMENT IMPACT OF THE WATERWAY
FOR YEAR 1977

REGION : WATER
Counties

(UNIT:MILLION DOLLARS)

INDUSTRY	OUTPUT WITH WATER WAY (A)	OUTPUT W/O WATER WAY (B)	DIFFERENCE (A)-(B)	PERCENTAGE -(C/B)*100
1.DAIRY FARM PROD	53.485	53.417	0.068	0.13%
2.POULTRY AND EGG	174.674	174.492	0.182	0.10%
3.MEAT ANIMAL PROD	168.571	168.395	0.176	0.10%
4.COTTON	61.928	61.698	0.230	0.37%
5.FOOD,FEED,GRAIN	365.686	364.612	1.074	0.29%
6.OILBEARING CROP	109.598	108.601	0.997	0.92%
7.FORESTRY,FISHERY	58.175	57.602	0.572	0.99%
8.FOOD,KINDRED PROD	2128.628	2128.247	0.381	0.02%
9.APPAREL & TEXTILE	297.504	297.424	0.080	0.03%
10.LUMBER,WOOD PROD	213.576	213.318	0.258	0.12%
11.FURNITURE,FIXTURE	269.279	269.252	0.027	0.01%
12.PAPER & ALLIED	785.321	784.414	0.907	0.12%
13.PRINTING,PUBLISH	319.726	319.703	0.024	0.01%
14.CHEMICAL & ALLIED	89.304	87.710	1.594	1.82%
15.PETROLEUM,ALLIED	3100.292	3098.236	2.056	0.07%
16.RUBBER, PLASTIC	530.693	529.112	1.581	0.30%
17.LEATHER	40.891	40.886	0.005	0.01%
18.STONE,CLAY,GLASS	290.495	289.750	0.745	0.26%
19.PRIMARY METAL	443.045	441.123	1.923	0.44%
20.FABRICATED METAL	1216.669	1215.103	1.566	0.13%
21.MACHINERY	1175.945	1175.456	0.488	0.04%
22.ELECTRICAL EQUIP	1326.999	1326.632	0.367	0.03%
23.MOTOR VEHICLE	1152.534	1152.180	0.354	0.03%
24.MISC.MANUFACTURE	430.773	430.648	0.124	0.03%
25.BITUMINOUS COAL	104.844	103.552	1.292	1.25%
26.PETROLEUM,NAT.GAS	403.206	403.246	-0.040	-0.01%
27.OTHER MINING	43.419	37.536	5.883	15.67%
28.CONSTRUCTION	2376.176	2375.808	0.367	0.02%
29.TRANSPORTATION	620.097	620.268	-0.172	-0.03%
30.WHOLE SALE,RETAIL	2745.827	2746.153	-0.326	-0.01%
31.FINANCE,INSURANCE	2806.569	2806.821	-0.253	-0.01%
32.COMMUNICATION	572.967	573.038	-0.071	-0.01%
33.ELEC,GAS,SANITARY	893.170	893.024	0.146	0.02%
34.HOTEL,OTHER SERV.	3153.051	3153.004	0.047	0.00%
35 GOVERNMENT	1522.387	1522.404	-0.017	-0.00%
TOTAL	30045.50	30022.86	22.64	0.08%

TABLE 4

DEMAND ADJUSTED SIMULATION
DEVELOPMENT IMPACT OF THE WATERWAY
FOR YEAR 1977

REGION : The Rest of
Arkansas and Oklahoma

(UNIT:MILLION DOLLARS)

INDUSTRY	OUTPUT WITH WATER WAY (A)	OUTPUT W/O WATER WAY (B)	DIFFERENCE (A)-(B)	PERCENTAGE -(C/B)*100
1.DAIRY FARM PROD	256.002	255.646	0.357	0.14%
2.POULTRY AND EGG	665.708	665.017	0.690	0.10%
3.MEAT ANIMAL PROD	833.532	832.605	0.927	0.11%
4.COTTON	303.421	302.260	1.161	0.38%
5.FOOD,FEED,GRAIN	1495.143	1491.988	3.156	0.21%
6.OILBEARING CROP	453.320	452.686	0.633	0.14%
7.FORESTRY,FISHERY	277.502	274.443	3.058	1.11%
8.FOOD,KINDRED PROD	2328.976	2328.576	0.400	0.02%
9.APPAREL & TEXTILE	731.985	731.702	0.283	0.04%
10.LUMBER,WOOD PROD	784.780	783.836	0.944	0.12%
11.FURNITURE,FIXTURE	149.122	149.112	0.011	0.01%
12.PAPER & ALLIED	510.052	509.381	0.671	0.13%
13.PRINTING,PUBLISH	278.902	278.883	0.020	0.01%
14.CHEMICAL & ALLIED	607.462	604.816	2.646	0.44%
15.PETROLEUM,ALLIED	1131.503	1128.972	2.531	0.22%
16.RUBBER, PLASTIC	643.904	642.017	1.886	0.29%
17.LEATHER	162.491	162.473	0.018	0.01%
18.STONE,CLAY,GLASS	251.969	250.950	1.019	0.41%
19.PRIMARY METAL	514.784	512.927	1.857	0.36%
20.FABRICATED MEIAL	479.788	479.658	0.130	0.03%
21.MACHINERY	858.196	858.042	0.154	0.02%
22.ELECTRICAL EQUIP	590.910	590.822	0.087	0.01%
23.MOTOR VEHICLE	490.649	490.613	0.037	0.01%
24.MISC.MANUFACTURE	226.218	226.182	0.036	0.02%
25.BITUMINOUS COAL	22.551	22.461	0.090	0.40%
26.PETROLEUM,NAT.GAS	3236.563	3236.891	-0.329	-0.01%
27.OTHER MINING	257.381	256.574	0.807	0.31%
28.CONSTRUCTION	2664.718	2664.266	0.451	0.02%
29.TRANSPORTATION	1256.512	1256.843	-0.330	-0.03%
30.WHOLE SALE,RETAIL	3675.803	3676.241	-0.438	-0.01%
31.FINANCE,INSURANCE	3467.403	3467.784	-0.381	-0.01%
32.COMMUNICATION	523.993	524.061	-0.068	-0.01%
33.ELEC,GAS,SANITARY	1026.896	1026.721	0.175	0.02%
34.HOTEL,OTHER SERV.	3964.915	3964.861	0.055	0.00%
35 GOVERNMENT	3174.464	3174.499	-0.035	-0.00%
TOTAL	38297.52	38274.81	22.71	0.06%

TABLE 4

DEMAND ADJUSTED SIMULATION
DEVELOPMENT IMPACT OF THE WATERWAY
FOR YEAR 1977

REGION :REST USA

(UNIT:MILLION DOLLARS)

INDUSTRY	OUTPUT WITH WATER WAY (A)	OUTPUT W/C WATER WAY (B)	DIFFERENCE (A)-(B)	PERCENTAGE -(C/B)*100
1.DAIRY FARM PROD	12072.411	12072.476	-0.065	-0.00%
2.POULTRY AND EGG	6360.791	6360.734	0.057	0.00%
3.MEAT ANIMAL PROD	35608.046	35607.064	0.982	0.00%
4.COTTON	4083.668	4083.698	-0.029	-0.00%
5.FOOD,FEED,GRAIN	32353.909	32354.548	-0.639	-0.00%
6.OILBEARING CROP	9595.112	9595.176	-0.064	-0.00%
7.FORESTRY,FISHERY	28722.475	28722.750	-0.275	-0.00%
8.FOOD,KINDRED PROD	184658.595	184656.298	2.297	0.00%
9.APPAREL & TEXTILE	78162.682	78162.930	-0.248	-0.00%
10.LUMBER,WOOD PROD	38660.900	38660.765	0.135	0.00%
11.FURNITURE,FIXTURE	14229.641	14229.657	-0.016	-0.00%
12.PAPER & ALLIED	43222.811	43221.683	1.127	0.00%
13.PRINTING,PUBLISH	42012.022	42011.847	0.174	0.00%
14.CHEMICAL & ALLIED	86075.106	86030.373	44.733	0.05%
15.PETROLEUM,ALLIED	51647.644	51644.558	3.086	0.01%
16.RUBBER, PLASTIC	33885.750	33884.723	1.028	0.00%
17.LEATHER	6367.651	6367.655	-0.005	-0.00%
18.STONE,CLAY,GLASS	30783.304	30782.537	0.767	0.00%
19.PRIMARY METAL	95929.382	95916.992	12.389	0.01%
20.FABRICATED METAL	76996.502	76995.139	1.363	0.00%
21.MACHINERY	105883.867	105882.531	1.336	0.00%
22.ELECTRICAL EQUIP	78263.112	78263.268	-0.155	-0.00%
23.MOTOR VEHICLE	143284.998	143284.810	0.188	0.00%
24.MISC.MANUFACTURE	55058.039	55057.925	0.115	0.00%
25.BITUMINOUS COAL	13926.528	13925.877	0.651	0.00%
26.PETROLEUM,NAT.GAS	47171.142	47170.392	0.751	0.00%
27.OTHER MINING	11689.104	11682.043	7.061	0.06%
28.CONSTRUCTION	238136.077	238134.498	1.579	0.00%
29.TRANSPORTATION	114606.484	114604.469	2.015	0.00%
30.WHOLE SALE,RETAIL	336046.165	336045.720	0.445	0.00%
31.FINANCE,INSURANCE	406764.697	406763.558	1.139	0.00%
32.COMMUNICATION	63998.346	63998.208	0.138	0.00%
33.ELEC,GAS,SANITARY	82657.740	82654.803	2.937	0.00%
34.HOTEL,OTHER SERV.	455390.155	455385.285	4.870	0.00%
35 GOVERNMENT	230323.298	230323.216	0.082	0.00%
TOTAL	3294628.15	3294538.21	89.95	0.00%

TABLE 4

DEMAND ADJUSTED SIMULATION
DEVELOPMENT IMPACT OF THE WATERWAY
FOR YEAR 1978

HIGH
REGION : WATER
Counties

(UNIT:MILLION DOLLARS)

INDUSTRY	OUTPUT WITH WATER WAY (A)	OUTPUT W/O WATER WAY (B)	DIFFERENCE (A)-(B)	PERCENTAGE -(C/B)*100
1.DAIRY FARM PROD	67.180	67.077	0.102	0.15%
2.POULTRY AND EGG	211.625	211.331	0.294	0.14%
3.MEAT ANIMAL PROD	267.368	267.086	0.282	0.11%
4.COTTON	41.641	41.304	0.337	0.82%
5.FOOD,FEED,GRAIN	366.447	364.692	1.755	0.48%
6.OILBEARING CROP	108.893	107.719	1.174	1.09%
7.FORESTRY,FISHERY	101.719	100.732	0.987	0.98%
8.FOOD,KINDRED PROD	2418.608	2417.927	0.680	0.03%
9.APPAREL & TEXTILE	286.878	286.738	0.140	0.05%
10.LUMBER,WOOD PROD	256.468	256.006	0.462	0.18%
11.FURNITURE,FIXTURE	292.010	291.967	0.043	0.01%
12.PAPER & ALLIED	930.592	929.106	1.486	0.16%
13.PRINTING,PUBLISH	345.874	345.817	0.057	0.02%
14.CHEMICAL & ALLIED	108.701	104.970	3.732	3.56%
15.PETROLEUM,ALLIED	3574.265	3571.200	3.065	0.09%
16.RUBBER, PLASTIC	547.207	544.463	2.745	0.50%
17.LEATHER	42.595	42.586	0.008	0.02%
18.STONE,CLAY,GLASS	398.455	397.014	1.442	0.36%
19.PRIMARY METAL	619.459	616.685	2.774	0.45%
20.FABRICATED METAL	1319.920	1317.638	2.282	0.17%
21.MACHINERY	1665.694	1664.955	0.740	0.04%
22.ELECTRICAL EQUIP	1452.250	1451.715	0.535	0.04%
23.MOTOR VEHICLE	1326.335	1325.831	0.504	0.04%
24.MISC.MANUFACTURE	465.323	465.101	0.223	0.05%
25.BITUMINOUS COAL	163.199	153.571	9.628	6.27%
26.PETROLEUM,NAT.GAS	444.822	444.908	-0.086	-0.02%
27.OTHER MINING	40.625	33.635	6.990	20.78%
28.CONSTRUCTION	3407.328	3406.695	0.633	0.02%
29.TRANSPORTATION	896.090	896.334	-0.245	-0.03%
30.WHOLE SALE,RETAIL	3755.733	3756.239	-0.506	-0.01%
31.FINANCE,INSURANCE	4505.373	4505.647	-0.274	-0.01%
32.COMMUNICATION	622.759	622.870	-0.110	-0.02%
33.ELEC,GAS,SANITARY	912.022	911.747	0.275	0.03%
34.HOTEL,OTHER SERV.	5100.986	5100.745	0.241	0.00%
35 GOVERNMENT	1643.956	1643.981	-0.025	-0.00%
TOTAL	38708.40	38666.03	42.37	0.11%

TABLE 4

DEMAND ADJUSTED SIMULATION
DEVELOPMENT IMPACT OF THE WATERWAY
FOR YEAR 1978

HIGH
REGION : The Rest of Arkansas and Oklahoma

(UNIT:MILLION DOLLARS)

INDUSTRY	OUTPUT WITH WATER WAY (A)	OUTPUT W/O WATER WAY (B)	DIFFERENCE (A)-(B)	PERCENTAGE -(C/B)*100
1.DAIRY FARM PROD	333.124	332.590	0.534	0.16%
2.POULTRY AND EGG	814.224	813.111	1.113	0.14%
3.MEAT ANIMAL PROD	1383.991	1382.519	1.472	0.11%
4.COTTON	242.708	241.027	1.680	0.70%
5.FOOD,FEED,GRAIN	1616.123	1610.909	5.214	0.32%
6.OILBEARING CROP	451.319	450.411	0.907	0.20%
7.FORESTRY,FISHERY	546.491	541.282	5.209	0.96%
8.FOOD,KINDRED PROD	2568.690	2567.985	0.705	0.03%
9.APPAREL & TEXTILE	689.453	688.975	0.478	0.07%
10.LUMBER,WOOD PROD	1031.015	1029.334	1.682	0.16%
11.FURNITURE,FIXTURE	162.614	162.596	0.018	0.01%
12.PAPER & ALLIED	611.924	610.892	1.032	0.17%
13.PRINTING,PUBLISH	296.317	296.268	0.049	0.02%
14.CHEMICAL & ALLIED	714.881	710.673	4.208	0.59%
15.PETROLEUM,ALLIED	1308.436	1305.103	3.333	0.26%
16.RUBBER, PLASTIC	640.161	636.874	3.288	0.52%
17.LEATHER	175.147	175.117	0.030	0.02%
18.STONE,CLAY,GLASS	384.418	383.325	1.094	0.29%
19.PRIMARY METAL	623.865	622.061	1.804	0.29%
20.FABRICATED METAL	514.990	514.757	0.233	0.05%
21.MACHINERY	1244.726	1244.463	0.264	0.02%
22.ELECTRICAL EQUIP	581.148	581.000	0.147	0.03%
23.MOTOR VEHICLE	465.416	465.357	0.059	0.01%
24.MISC.MANUFACTURE	242.465	242.395	0.070	0.03%
25.BITUMINOUS COAL	31.390	30.581	0.810	2.65%
26.PETROLEUM,NAT.GAS	3594.247	3594.928	-0.681	-0.02%
27.OTHER MINING	235.477	234.613	0.864	0.37%
28.CONSTRUCTION	3985.618	3985.037	0.581	0.01%
29.TRANSPORTATION	1766.371	1766.918	-0.547	-0.03%
30.WHOLE SALE,RETAIL	5066.313	5067.015	-0.702	-0.01%
31.FINANCE,INSURANCE	5629.523	5629.994	-0.471	-0.01%
32.COMMUNICATION	452.375	452.483	-0.108	-0.02%
33.ELEC,GAS,SANITARY	926.254	925.950	0.304	0.03%
34.HOTEL,OTHER SERV.	6565.443	6565.148	0.295	0.00%
35 GOVERNMENT	3422.504	3422.556	-0.052	-0.00%
TOTAL	49319.16	49284.25	34.91	0.07%

TABLE 4

DEMAND ADJUSTED SIMULATICN
DEVELOPMENT IMPACT OF THE WATERWAY
FOR YEAR 1978

HIGH
REGION :REST USA

(UNIT:MILLION DOLLARS)

INDUSTRY	OUTPUT WITH WATER WAY (A)	OUTPUT W/C WATER WAY (B)	DIFFERENCE (A)-(B)	PERCENTAGE -(C/B)*100
1.DAIRY FARM PROD	12949.071	12949.126	-0.055	-0.00%
2.POULTRY AND EGG	7311.265	7311.139	0.126	0.00%
3.MEAT ANIMAL PROD	47921.177	47919.712	1.464	0.00%
4.COTTON	3595.494	3595.526	-0.032	-0.00%
5.FOOD,FEED,GRAIN	33068.843	33069.938	-1.094	-0.00%
6.OILBEARING CROP	11194.698	11194.782	-0.085	-0.00%
7.FORESTRY,FISHERY	41428.735	41429.053	-0.318	-0.00%
8.FOOD,KINDRED PROD	201253.938	201249.518	4.420	0.00%
9.APPAREL & TEXTILE	80957.408	80957.235	0.174	0.00%
10.LUMBER,WOOD PROD	44408.578	44408.142	0.435	0.00%
11.FURNITURE,FIXTURE	16237.801	16237.814	-0.013	-0.00%
12.PAPER & ALLIED	47516.461	47513.946	2.515	0.01%
13.PRINTING,PUBLISH	46709.262	46708.921	0.340	0.00%
14.CHEMICAL & ALLIED	94832.035	94756.415	75.620	0.08%
15.PETROLEUM,ALLIED	57717.980	57714.107	3.872	0.01%
16.RUBBER, PLASTIC	38396.671	38394.666	2.005	0.01%
17.LEATHER	6895.532	6895.529	0.003	0.00%
18.STONE,CLAY,GLASS	35160.024	35158.758	1.266	0.00%
19.PRIMARY METAL	108324.949	108306.802	18.148	0.02%
20.FABRICATED METAL	86833.613	86831.111	2.502	0.00%
21.MACHINERY	121740.202	121738.142	2.060	0.00%
22.ELECTRICAL EQUIP	90672.926	90673.084	-0.158	-0.00%
23.MOTOR VEHICLE	160925.808	160925.397	0.412	0.00%
24.MISC.MANUFACTURE	61605.93[illegible]	61605.691	0.241	0.00%
25.BITUMINOUS COAL	17856.448	17853.189	3.259	0.02%
26.PETROLEUM,NAT.GAS	60023.456	60023.003	0.453	0.00%
27.OTHER MINING	14508.790	14501.860	6.931	0.05%
28.CONSTRUCTION	337112.532	337110.275	2.257	0.00%
29.TRANSPORTATION	139328.494	139325.332	3.162	0.00%
30.WHOLE SALE,RETAIL	446438.260	446437.558	0.701	0.00%
31.FINANCE,INSURANCE	580277.737	580276.516	1.221	0.00%
32.COMMUNICATION	73750.472	73750.297	0.175	0.00%
33.ELEC,GAS,SANITARY	93160.846	93150.756	10.090	0.01%
34.HOTEL,OTHER SERV.	705225.243	705217.016	8.227	0.00%
35 GOVERNMENT	249075.919	249075.785	0.135	0.00%
TOTAL	4174416.60	4174266.14	150.46	0.00%

TABLE 4

DEMAND ADJUSTED SIMULATION
DEVELOPMENT IMPACT OF THE WATERWAY
FOR YEAR 1978

MEDIUM
REGION : WATER
Counties

(UNIT:MILLION DOLLARS)

INDUSTRY	OUTPUT WITH WATER WAY (A)	OUTPUT W/C WATER WAY (B)	DIFFERENCE (A)-(B)	PERCENTAGE -(C/B)*100
1.DAIRY FARM PROD	67.180	67.107	0.073	0.11%
2.POULTRY AND EGG	211.625	211.417	0.208	0.10%
3.MEAT ANIMAL PROD	267.368	267.167	0.201	0.08%
4.COTTON	41.641	41.403	0.238	0.57%
5.FOOD,FEED,GRAIN	366.447	365.145	1.302	0.36%
6.OILBEARING CROP	108.893	107.969	0.924	0.86%
7.FORESTRY,FISHERY	101.719	101.022	0.697	0.69%
8.FOOD,KINDRED PROD	2418.608	2418.124	0.483	0.02%
9.APPAREL & TEXTILE	286.878	286.781	0.097	0.03%
10.LUMBER,WOOD PROD	256.468	256.150	0.318	0.12%
11.FURNITURE,FIXTURE	292.010	291.979	0.031	0.01%
12.PAPER & ALLIED	930.592	929.535	1.056	0.11%
13.PRINTING,PUBLISH	345.874	345.835	0.039	0.01%
14.CHEMICAL & ALLIED	108.701	106.102	2.600	2.45%
15.PETROLEUM,ALLIED	3574.265	3571.952	2.313	0.06%
16.RUBBER, PLASTIC	547.207	545.279	1.928	0.35%
17.LEATHER	42.595	42.589	0.006	0.01%
18.STONE,CLAY,GLASS	398.455	397.373	1.082	0.27%
19.PRIMARY METAL	619.459	617.310	2.149	0.35%
20.FABRICATED METAL	1319.920	1318.215	1.705	0.13%
21.MACHINERY	1665.694	1665.171	0.523	0.03%
22.ELECTRICAL EQUIP	1452.250	1451.855	0.395	0.03%
23.MOTOR VEHICLE	1326.335	1325.954	0.382	0.03%
24.MISC.MANUFACTURE	465.323	465.164	0.159	0.03%
25.BITUMINOUS COAL	163.199	160.010	3.189	1.99%
26.PETROLEUM,NAT.GAS	444.822	444.869	-0.047	-0.01%
27.OTHER MINING	40.625	34.988	5.637	16.11%
28.CONSTRUCTION	3407.328	3406.866	0.462	0.01%
29.TRANSPORTATION	896.090	896.268	-0.178	-0.02%
30.WHOLE SALE,RETAIL	3755.733	3756.144	-0.411	-0.01%
31.FINANCE,INSURANCE	4505.373	4505.605	-0.231	-0.01%
32.COMMUNICATION	622.759	622.842	-0.082	-0.01%
33.ELEC,GAS,SANITARY	912.022	911.844	0.178	0.02%
34.HOTEL,OTHER SERV.	5100.986	5100.852	0.134	0.00%
35 GOVERNMENT	1643.956	1643.975	-0.019	-0.00%
TOTAL	38708.40	38680.86	27.54	0.07%

TABLE 4

DEMAND ADJUSTED SIMULATION
DEVELOPMENT IMPACT OF THE WATERWAY
FOR YEAR 1978

MEDIUM
REGION : The Rest of
Arkansas and Oklahoma

(UNIT:MILLION DOLLARS)

INDUSTRY	OUTPUT WITH WATER WAY (A)	OUTPUT W/O WATER WAY (B)	DIFFERENCE (A)-(B)	PERCENTAGE -(C/B)*100
1.DAIRY FARM PROD	333.124	332.744	0.380	0.11%
2.POULTRY AND EGG	814.224	813.436	0.788	0.10%
3.MEAT ANIMAL PROD	1383.991	1382.942	1.049	0.08%
4.COTTON	242.708	241.523	1.185	0.49%
5.FOOD,FEED,GRAIN	1616.123	1612.365	3.759	0.23%
6.OILBEARING CROP	451.319	450.662	0.657	0.15%
7.FORESTRY,FISHERY	546.491	542.820	3.672	0.68%
8.FOOD,KINDRED PROD	2568.690	2568.190	0.501	0.02%
9.APPAREL & TEXTILE	689.453	689.122	0.332	0.05%
10.LUMBER,WOOD PROD	1031.015	1029.858	1.157	0.11%
11.FURNITURE,FIXTURE	162.614	162.602	0.013	0.01%
12.PAPER & ALLIED	611.924	611.192	0.732	0.12%
13.PRINTING,PUBLISH	296.317	296.284	0.033	0.01%
14.CHEMICAL & ALLIED	714.881	711.907	2.974	0.42%
15.PETROLEUM,ALLIED	1308.436	1305.776	2.661	0.20%
16.RUBBER, PLASTIC	640.161	637.858	2.303	0.36%
17.LEATHER	175.147	175.126	0.021	0.01%
18.STONE,CLAY,GLASS	384.418	383.585	0.833	0.22%
19.PRIMARY METAL	623.865	622.489	1.376	0.22%
20.FABRICATED METAL	514.990	514.834	0.156	0.03%
21.MACHINERY	1244.726	1244.557	0.169	0.01%
22.ELECTRICAL EQUIP	581.148	581.044	0.103	0.02%
23.MOTOR VEHICLE	465.416	465.373	0.043	0.01%
24.MISC.MANUFACTURE	242.465	242.416	0.049	0.02%
25.BITUMINOUS COAL	31.390	31.162	0.228	0.73%
26.PETROLEUM,NAT.GAS	3594.247	3594.629	-0.382	-0.01%
27.OTHER MINING	235.477	234.813	0.664	0.28%
28.CONSTRUCTION	3985.618	3985.191	0.427	0.01%
29.TRANSPORTATION	1766.371	1766.750	-0.380	-0.02%
30.WHOLE SALE,RETAIL	5066.313	5066.874	-0.561	-0.01%
31.FINANCE,INSURANCE	5629.523	5629.891	-0.368	-0.01%
32.COMMUNICATION	452.375	452.455	-0.080	-0.02%
33.ELEC,GAS,SANITARY	926.254	926.055	0.199	0.02%
34.HOTEL,OTHER SERV.	6565.443	6565.278	0.165	0.00%
35 GOVERNMENT	3422.504	3422.544	-0.040	-0.00%
TOTAL	49319.16	49294.34	24.82	0.05%

TABLE 4

DEMAND ADJUSTED SIMULATION
DEVELOPMENT IMPACT OF THE WATERWAY
FOR YEAR 1978

MEDIUM
REGION :REST USA

(UNIT:MILLION DOLLARS)

INDUSTRY	OUTPUT WITH WATER WAY (A)	OUTPUT W/O WATER WAY (B)	DIFFERENCE (A)-(B)	PERCENTAGE -(C/B)*100
1.DAIRY FARM PROD	12949.071	12949.099	-0.028	-0.00%
2.POULTRY AND EGG	7311.265	7311.173	0.092	0.00%
3.MEAT ANIMAL PROD	47921.177	47920.061	1.115	0.00%
4.COTTON	3595.494	3595.517	-0.023	-0.00%
5.FOOD,FEED,GRAIN	33068.843	33069.615	-0.771	-0.00%
6.OILBEARING CROP	11194.698	11194.749	-0.051	-0.00%
7.FORESTRY,FISHERY	41428.735	41428.952	-0.217	-0.00%
8.FOOD,KINDRED PROD	201253.938	201250.770	3.168	0.00%
9.APPAREL & TEXTILE	80957.408	80957.311	0.097	0.00%
10.LUMBER,WOOD PROD	44408.578	44408.340	0.238	0.00%
11.FURNITURE,FIXTURE	16237.801	16237.813	-0.012	-0.00%
12.PAPER & ALLIED	47516.461	47514.905	1.555	0.00%
13.PRINTING,PUBLISH	46709.262	46709.023	0.238	0.00%
14.CHEMICAL & ALLIED	94832.035	94779.016	53.020	0.06%
15.PETROLEUM,ALLIED	57717.980	57714.938	3.041	0.01%
16.RUBBER, PLASTIC	38396.671	38395.306	1.365	0.00%
17.LEATHER	6895.532	6895.530	0.002	0.00%
18.STONE,CLAY,GLASS	35160.024	35159.279	0.744	0.00%
19.PRIMARY METAL	108324.949	108313.143	11.807	0.01%
20.FABRICATED METAL	86833.613	86832.154	1.458	0.00%
21.MACHINERY	121740.202	121738.847	1.355	0.00%
22.ELECTRICAL EQUIP	90672.926	90673.081	-0.155	-0.00%
23.MOTOR VEHICLE	160925.808	160925.571	0.238	0.00%
24.MISC.MANUFACTURE	61605.932	61605.781	0.151	0.00%
25.BITUMINOUS COAL	17856.448	17855.279	1.169	0.01%
26.PETROLEUM,NAT.GAS	60023.456	60022.798	0.658	0.00%
27.OTHER MINING	14508.790	14503.397	5.394	0.04%
28.CONSTRUCTION	337112.532	337110.853	1.678	0.00%
29.TRANSPORTATION	139328.494	139326.103	2.391	0.00%
30.WHOLE SALE,RETAIL	446438.260	446437.627	0.632	0.00%
31.FINANCE,INSURANCE	580277.737	580276.594	1.143	0.00%
32.COMMUNICATION	73750.472	73750.313	0.158	0.00%
33.ELEC,GAS,SANITARY	93160.846	93156.562	4.284	0.00%
34.HOTEL,OTHER SERV.	705225.243	705219.319	5.924	0.00%
35 GOVERNMENT	249075.919	249075.824	0.095	0.00%
TOTAL	4174416.60	4174314.64	101.95	0.00%

TABLE 4

DEMAND ADJUSTED SIMULATION
DEVELOPMENT IMPACT OF THE WATERWAY
FOR YEAR 1978

LOW
REGION : WATER
Counties

(UNIT:MILLION DOLLARS)

INDUSTRY	OUTPUT WITH WATER WAY (A)	OUTPUT W/O WATER WAY (B)	DIFFERENCE (A)-(B)	PERCENTAGE -(C/B)*100
1.DAIRY FARM PROD	67.180	67.136	0.044	0.06%
2.POULTRY AND EGG	211.625	211.502	0.124	0.06%
3.MEAT ANIMAL PROD	267.368	267.247	0.121	0.05%
4.COTTON	41.641	41.502	0.139	0.34%
5.FOOD,FEED,GRAIN	366.447	365.601	0.846	0.23%
6.OILBEARING CROP	108.893	108.225	0.668	0.62%
7.FORESTRY,FISHERY	101.719	101.310	0.408	0.40%
8.FOOD,KINDRED PROD	2418.608	2418.317	0.291	0.01%
9.APPAREL & TEXTILE	286.878	286.822	0.056	0.02%
10.LUMBER,WOOD PROD	256.468	256.281	0.188	0.07%
11.FURNITURE,FIXTURE	292.010	291.991	0.019	0.01%
12.PAPER & ALLIED	930.592	929.961	0.631	0.07%
13.PRINTING,PUBLISH	345.874	345.851	0.023	0.01%
14.CHEMICAL & ALLIED	108.701	107.262	1.439	1.34%
15.PETROLEUM,ALLIED	3574.265	3572.647	1.618	0.05%
16.RUBBER, PLASTIC	547.207	546.089	1.119	0.20%
17.LEATHER	42.595	42.591	0.003	0.01%
18.STONE,CLAY,GLASS	398.455	397.720	0.735	0.18%
19.PRIMARY METAL	619.459	617.922	1.537	0.25%
20.FABRICATED METAL	1319.920	1318.748	1.172	0.09%
21.MACHINERY	1665.694	1665.322	0.372	0.02%
22.ELECTRICAL EQUIP	1452.250	1451.990	0.261	0.02%
23.MOTOR VEHICLE	1326.335	1326.075	0.261	0.02%
24.MISC.MANUFACTURE	465.323	465.225	0.098	0.02%
25.BITUMINOUS COAL	163.199	160.800	2.399	1.49%
26.PETROLEUM,NAT.GAS	444.822	444.828	-0.006	-0.00%
27.OTHER MINING	40.625	36.445	4.180	11.47%
28.CONSTRUCTION	3407.328	3407.001	0.327	0.01%
29.TRANSPORTATION	896.090	896.169	-0.079	-0.01%
30.WHOLE SALE,RETAIL	3755.733	3755.958	-0.225	-0.01%
31.FINANCE,INSURANCE	4505.373	4505.446	-0.073	-0.00%
32.COMMUNICATION	622.759	622.806	-0.046	-0.01%
33.ELEC,GAS,SANITARY	912.022	911.857	0.165	0.02%
34.HOTEL,OTHER SERV.	5100.986	5100.887	0.100	0.00%
35 GOVERNMENT	1643.956	1643.966	-0.010	-0.00%
TOTAL	38708.40	38689.50	18.90	0.05%

TABLE 4

DEMAND ADJUSTED SIMULATION
DEVELOPMENT IMPACT OF THE WATERWAY
FOR YEAR 1978

LOW
REGION : The Rest of
Arkansas and Oklahoma

(UNIT:MILLION DOLLARS)

INDUSTRY	OUTPUT WITH WATER WAY (A)	OUTPUT W/O WATER WAY (B)	DIFFERENCE (A).-(B)	PERCENTAGE -(C/B)*100
1.DAIRY FARM PROD	333.124	332.896	0.228	0.07%
2.POULTRY AND EGG	814.224	813.755	0.469	0.06%
3.MEAT ANIMAL PROD	1383.991	1383.359	0.633	0.05%
4.COTTON	242.708	242.008	0.699	0.29%
5.FOOD,FEED,GRAIN	1616.123	1613.796	2.327	0.14%
6.OILBEARING CROP	451.319	450.909	0.410	0.09%
7.FORESTRY,FISHERY	546.491	544.318	2.173	0.40%
8.FOOD,KINDRED PROD	2568.690	2568.387	0.303	0.01%
9.APPAREL & TEXTILE	689.453	689.260	0.193	0.03%
10.LUMBER,WOOD PROD	1031.015	1030.332	0.683	0.07%
11.FURNITURE,FIXTURE	162.614	162.607	0.008	0.00%
12.PAPER & ALLIED	611.924	611.484	0.441	0.07%
13.PRINTING,PUBLISH	296.317	296.297	0.020	0.01%
14.CHEMICAL & ALLIED	714.881	713.107	1.774	0.25%
15.PETROLEUM,ALLIED	1308.436	1306.427	2.009	0.15%
16.RUBBER, PLASTIC	640.161	638.814	1.348	0.21%
17.LEATHER	175.147	175.135	0.013	0.01%
18.STONE,CLAY,GLASS	384.418	383.833	0.586	0.15%
19.PRIMARY METAL	623.865	622.902	0.963	0.15%
20.FABRICATED METAL	514.990	514.891	0.098	0.02%
21.MACHINERY	1244.726	1244.605	0.121	0.01%
22.ELECTRICAL EQUIP	581.148	581.085	0.062	0.01%
23.MOTOR VEHICLE	465.416	465.389	0.027	0.01%
24.MISC.MANUFACTURE	242.465	242.435	0.029	0.01%
25.BITUMINOUS COAL	31.390	31.222	0.168	0.54%
26.PETROLEUM,NAT.GAS	3594.247	3594.305	-0.058	-0.00%
27.OTHER MINING	235.477	235.010	0.467	0.20%
28.CONSTRUCTION	3985.618	3985.307	0.311	0.01%
29.TRANSPORTATION	1766.371	1766.534	-0.163	-0.01%
30.WHOLE SALE,RETAIL	5066.313	5066.621	-0.308	-0.01%
31.FINANCE,INSURANCE	5629.523	5629.671	-0.148	-0.00%
32.COMMUNICATION	452.375	452.420	-0.045	-0.01%
33.ELEC,GAS,SANITARY	926.254	926.066	0.188	0.02%
34.HOTEL,OTHER SERV.	6565.443	6565.318	0.125	0.00%
35 GOVERNMENT	3422.504	3422.525	-0.021	-0.00%
TOTAL	49319.16	49303.03	16.13	0.03%

TABLE 4

DEMAND ADJUSTED SIMULATION
DEVELOPMENT IMPACT OF THE WATERWAY
FOR YEAR 1978

LOW
REGION :REST USA

(UNIT:MILLION DOLLARS)

INDUSTRY	OUTPUT WITH WATER WAY (A)	OUTPUT W/O WATER WAY (B)	DIFFERENCE (A)-(B)	PERCENTAGE -(C/B)*100
1.DAIRY FARM PROD	12949.071	12949.082	-0.011	-0.00%
2.POULTRY AND EGG	7311.265	7311.206	0.059	0.00%
3.MEAT ANIMAL PROD	47921.177	47920.432	0.745	0.00%
4.COTTON	3595.494	3595.508	-0.013	-0.00%
5.FOOD,FEED,GRAIN	33068.843	33069.317	-0.473	-0.00%
6.OILBEARING CROP	11194.698	11194.726	-0.028	-0.00%
7.FORESTRY,FISHERY	41428.735	41428.882	-0.147	-0.00%
8.FOOD,KINDRED PROD	201253.938	201251.943	1.995	0.00%
9.APPAREL & TEXTILE	80957.408	80957.364	0.045	0.00%
10.LUMBER,WOOD PROD	44408.578	44408.448	0.129	0.00%
11.FURNITURE,FIXTURE	16237.801	16237.810	-0.009	-0.00%
12.PAPER & ALLIED	47516.461	47515.529	0.931	0.00%
13.PRINTING,PUBLISH	46709.262	46709.123	0.139	0.00%
14.CHEMICAL & ALLIED	94832.035	94801.068	30.968	0.03%
15.PETROLEUM,ALLIED	57717.980	57715.741	2.238	0.00%
16.RUBBER, PLASTIC	38396.671	38395.867	0.804	0.00%
17.LEATHER	6895.532	6895.531	0.001	0.00%
18.STONE,CLAY,GLASS	35160.024	35159.521	0.502	0.00%
19.PRIMARY METAL	108324.949	108316.518	8.432	0.01%
20.FABRICATED METAL	86833.613	86832.640	0.973	0.00%
21.MACHINERY	121740.202	121739.232	0.970	0.00%
22.ELECTRICAL EQUIP	90672.926	90673.011	-0.085	-0.00%
23.MOTOR VEHICLE	160925.808	160925.642	0.166	0.00%
24.MISC.MANUFACTURE	61605.932	61605.834	0.098	0.00%
25.BITUMINOUS COAL	17856.448	17855.616	0.832	0.00%
26.PETROLEUM,NAT.GAS	60023.456	60022.872	0.585	0.00%
27.OTHER MINING	14508.790	14504.873	3.918	0.03%
28.CONSTRUCTION	337112.532	337111.436	1.096	0.00%
29.TRANSPORTATION	139328.494	139327.031	1.463	0.00%
30.WHOLE SALE,RETAIL	446438.260	446437.918	0.341	0.00%
31.FINANCE,INSURANCE	580277.737	580276.964	0.773	0.00%
32.COMMUNICATION	73750.472	73750.384	0.088	0.00%
33.ELEC,GAS,SANITARY	93160.846	93157.987	2.859	0.00%
34.HOTEL,OTHER SERV.	705225.243	705221.712	3.530	0.00%
35 GOVERNMENT	249075.919	249075.863	0.056	0.00%
TOTAL	4174416.60	4174352.63	63.97	0.00%

TABLE 5

Regional Deflation Impact of the Waterway Transportation in 1978 (Medium Estimate)

	Industry	Water	Non-Water	Rest of U.S. (%)
1.	Dairy farm products	0.1586	0.1625	0.0054
2.	Poultry and eggs	0.1777	0.1752	0.0060
3.	Meat animals and products	0.0987	0.0965	0.0085
4.	Cotton	0.5739	0.5876	0.0032
5.	Food and feed grains	0.4158	0.3716	0.0024
6.	Oil bearing crops	0.1902	0.1953	0.0029
7.	Misc. agricultural products	0.6414	0.6816	0.0016
8.	Food and kindred products	0.0847	0.0819	0.0060
9.	Apparel and textile products	0.1237	0.1491	0.0046
10.	Lumber and wood products	0.1420	0.1362	0.0023
11.	Furniture and fixtures	0.0960	0.0758	0.0028
12.	Paper and allied products	0.1670	0.1734	0.0034
13.	Printing and publishing	0.0576	0.0588	0.0017
14.	Chemical and allied products	0.6975	0.7988	0.0033
15.	Petroleum and allied products	0.1815	0.1710	0.0026
16.	Rubber, Plastic	0.5850	0.6078	0.0032
17.	Leather	0.0614	0.0549	0.0031
18.	Stone, clay and glass products	0.2939	0.2504	0.0033
19.	Primary metal products	0.2784	0.2799	0.0051
20.	Fabricated metal	0.2162	0.0836	0.0029
21.	Machinery except electrical	0.0984	0.0403	0.0021
22.	Electrical equipment	0.0863	0.0572	0.0021
23.	Motor vehicle and transp. equip.	0.1546	0.0652	0.0026
24.	Misc. manufacturing	0.1636	0.1050	0.0021
25.	Bituminous coal	0.0552	0.0480	0.0064
26.	Crude petroleum and natural gas	0.0370	0.0341	0.0006
27.	Other mining except petroleum, gas and coal	0.2493	0.2060	0.0028
28.	Contract construction	0.1254	0.1062	0.0022
29.	Transportation	0.0281	0.0300	0.0010
30.	Wholesale and retail trade	0.0127	0.0131	0.0005
31.	Finance, insurance and real estate	0.0104	0.0106	0.0004
32.	Communications, radio and TV broadcasting	0.0111	0.0108	0.0004
33.	Electric, gas and sanitary services	0.0405	0.0413	0.0039
34.	Hotel and other services	0.0481	0.0491	0.0012
35.	Government	0.0101	0.1030	0.0003

TABLE 6

The Change in Trade Coefficients by the Waterway Transportation for the Agricultural Products

	Without Waterway			With Waterway			Percentage Change		
1. Dairy farm products	0.07282	0.06089	0.00403	0.07289	0.06095	0.00404	-.094	-.097	-.149
	0.30770	0.29745	0.02112	0.30800	0.29775	0.02115	-.097	-.101	-.153
	0.61948	0.64165	0.97485	0.61911	0.64129	0.97481	0.060	0.056	0.004
2. Poultry and eggs	0.15616	0.14840	0.01948	0.15624	0.14848	0.01951	-.051	-.053	-.155
	0.55264	0.54878	0.07542	0.55291	0.54906	0.07554	-.049	-.051	-.153
	0.29119	0.30282	0.90510	0.29084	0.30246	0.90495	0.120	0.118	0.016
3. Meat animals and products	0.05941	0.05399	0.00347	0.05945	0.05402	0.00347	-.059	-.061	-.088
	0.28904	0.28001	0.01897	0.28921	0.28017	0.01898	-.057	-.058	-.086
	0.65154	0.66601	0.97757	0.65134	0.66581	0.97755	0.031	0.030	0.002
4. Cotton	0.19106	0.11683	0.01946	0.19114	0.11688	0.01956	-.041	-.043	-.503
	0.72039	0.78861	0.09394	0.72078	0.78906	0.09442	-.054	-.057	-.517
	0.08855	0.09456	0.88661	0.08808	0.09407	0.88602	0.532	0.529	0.066
5. Food and feed grains	0.17077	0.09060	0.00492	0.17104	0.09075	0.00496	-.157	-.166	-.817
	0.50145	0.56783	0.02000	0.50202	0.56852	0.02009	-.113	-.122	-.458
	0.32777	0.34157	0.97508	0.32693	0.34073	0.97495	0.256	0.248	0.014
6. Oil bearing crops	0.15499	0.15394	0.01011	0.15504	0.15399	0.01028	-.032	-.033	-1.682
	0.65412	0.65436	0.04230	0.65437	0.65461	0.04239	-.037	-.038	-.209
	0.19088	0.19170	0.94759	0.19059	0.19140	0.94733	0.155	0.155	0.028
7. Miscellaneous agricultura products	0.17552	0.16594	0.0	0.17546	0.16588	0.0	0.033	0.034	0.0
	0.82448	0.83406	0.0	0.82454	0.83412	0.0	-.007	-.007	0.0
	0.0	0.0	1.00000	0.0	0.0	1.00000	0.0	0.0	0.0

TABLE 7

The Change in Trade Coefficients by the Waterway Transportation for the Manufacturing

	Without Waterway			With Waterway			Percentage Change		
8. Food and kindred products	0.27612	0.20771	0.00425	0.27622	0.20779	0.00425	-.038	-.043	-.078
	0.25558	0.25812	0.00469	0.25567	0.25822	0.00469	-.035	-.040	-.075
	0.46830	0.53418	0.99106	0.46811	0.53398	0.99106	0.041	0.036	0.001
9. Apparel and textile products	0.10281	0.08519	0.00132	0.10289	0.08526	0.00132	-.074	-.082	-.119
	0.22554	0.18971	0.00350	0.22576	0.18992	0.00350	-.100	-.107	-.144
	0.67165	0.72509	0.99519	0.67135	0.72482	0.99518	0.045	0.037	0.001
10. Lumber and wood products	0.19355	0.15638	0.00298	0.19360	0.15644	0.00298	-.021	-.040	-.138
	0.68637	0.57849	0.01193	0.68648	0.57869	0.01194	-.015	-.035	-.132
	0.12007	0.26514	0.98509	0.11993	0.26487	0.98507	0.119	0.099	0.002
11. Furniture and fixtures	0.11993	0.11498	0.01463	0.12003	0.11507	0.01464	-.077	-.078	-.091
	0.06750	0.06656	0.00795	0.06754	0.06660	0.00795	-.057	-.057	-.071
	0.81256	0.81846	0.97742	0.81243	0.81833	0.97740	0.016	0.016	0.002
12. Paper and allied products	0.12867	0.10675	0.01237	0.12884	0.10689	0.01239	-.129	-.133	-.160
	0.08011	0.07788	0.00825	0.08021	0.07799	0.00826	-.135	-.139	-.166
	0.79122	0.81536	0.97938	0.79094	0.81511	0.97934	0.035	0.031	0.004
13. Printing and publishing	0.50918	0.42662	0.00154	0.50921	0.42664	0.00154	-.006	-.005	-.056
	0.38405	0.46923	0.00106	0.38407	0.46926	0.00106	-.007	-.006	-.057
	0.10677	0.10416	0.99740	0.10672	0.10410	0.99740	0.050	0.051	0.000
14. Chemical and allied products	0.02402	0.01726	0.00033	0.02355	0.01759	0.00035	1.984	-1.882	-6.817
	0.13131	0.12364	0.00264	0.12889	0.12123	0.00266	1.880	1.983	-.788
	0.84467	0.85910	0.99704	0.84756	0.86118	0.99699	-.341	-.241	0.004

TABLE 7 (continued)

	Without Waterway			With Waterway			Percentage Change		
15. Petroleum and allied products	0.60422	0.35759	0.01176	0.60418	0.35670	0.01178	0.007	0.249	-.172
	0.19431	0.21533	0.00534	0.19515	0.21477	0.00538	-.434	0.260	-.828
	0.20147	0.42709	0.98290	0.20067	0.42853	0.98284	0.402	-.338	0.007
16. Rubber, Plastic	0.14101	0.13448	0.00825	0.14159	0.13503	0.00830	-.408	-.410	-.570
	0.14975	0.15287	0.00961	0.15040	0.15353	0.00967	-.431	-.433	-.592
	0.70924	0.71265	0.98214	0.70802	0.71143	0.98203	0.173	0.171	0.011
17. Leather	0.03223	0.03386	0.00432	0.03224	0.03388	0.00433	-.050	-.049	-.057
	0.12981	0.13840	0.01800	0.12987	0.13846	0.01801	-.043	-.043	-.051
	0.83796	0.82774	0.97768	0.83789	0.82766	0.97767	0.009	0.009	0.001
18. Stone, clay and glass products	0.32722	0.30486	0.00479	0.32764	0.30522	0.00481	-.129	-.120	-.288
	0.26745	0.33214	0.00441	0.26768	0.33239	0.00442	-.086	-.076	-.244
	0.40534	0.36301	0.99080	0.40468	0.36239	0.99077	0.161	0.171	0.002
19. Primary metal products	0.09952	0.06053	0.00324	0.09982	0.06065	0.00324	-.297	-.202	-.271
	0.04236	0.13359	0.00306	0.04225	0.13387	0.00307	0.248	-.204	-.273
	0.85812	0.80588	0.99370	0.85793	0.80548	0.99368	0.022	0.049	0.002
20. Fabricated metal	0.35077	0.35503	0.00525	0.35122	0.35548	0.00526	-.127	-.126	-.212
	0.13725	0.14547	0.00206	0.13725	0.14546	0.00206	0.005	0.007	-.079
	0.51198	0.49949	0.99269	0.51154	0.49905	0.99268	0.086	0.088	0.001
21. Machinery except electr - cal	0.18826	0.17812	0.00598	0.18840	0.17825	0.00599	-.073	-.074	-.096
	0.13032	0.12848	0.00479	0.13034	0.12850	0.00480	-.015	-.016	-.037
	0.68142	0.69341	0.98922	0.68127	0.69325	0.98922	0.023	0.022	0.001
22. Electrical equipment	0.21120	0.12535	0.00908	0.21134	0.12543	0.00909	-.063	-.070	-.083
	0.06515	0.07430	0.00414	0.06517	0.07433	0.00414	-.034	-.040	-.054
	0.72364	0.80035	0.98678	0.72349	0.80024	0.98677	0.021	0.015	0.001
23. Motor vehicle & transportation equipment	0.13522	0.17313	0.00371	0.13539	0.17334	0.00372	-.129	-.121	-.151
	0.04429	0.06531	0.00126	0.04430	0.06533	0.00126	-.039	-.032	-.062
	0.82050	0.76156	0.99503	0.82031	0.76133	0.99502	0.023	0.031	0.001
24. Miscellaneous manufacturing	0.19395	0.18312	0.00326	0.19419	0.18334	0.00327	-.120	-.121	-.161
	0.10016	0.10776	0.00180	0.10022	0.10782	0.00180	-.061	-.062	-.102
	0.70589	0.70912	0.99494	0.70559	0.70884	0.99493	0.042	0.041	0.001

TABLE 8

The Change in Trade Coefficients by the Waterway Transportation for Mining

	Without Waterway			With Waterway			Percentage Change		
25. Bituminous coal	0.19095	0.14009	0.00158	0.19102	0.14015	0.00190	-.038	-.040	-.028
	0.02881	0.03464	0.00042	0.02881	0.03465	0.00044	-.031	-.033	-.044
	0.78024	0.82527	0.99800	0.78016	0.82520	0.99765	0.010	0.008	0.035
26. Crude petroleum & natural gas	0.09725	0.09433	0.00396	0.09726	0.09434	0.00397	-.008	-.008	-.035
	0.73002	0.74661	0.03332	0.73006	0.74665	0.03333	-.006	-.005	-.032
	0.17273	0.15906	0.96272	0.17268	0.15902	0.96271	0.028	0.028	0.001
27. Other mining except petroleum, gas and coal	0.07027	0.09898	0.00194	0.09896	0.09622	0.00212	-28.993	2.873	-8.387
	0.50897	0.51590	0.01328	0.49372	0.50128	0.01330	3.089	2.917	-.182
	0.42076	0.38511	0.98478	0.40732	0.40250	0.98458	3.299	-4.320	0.021

TABLE 9

The Change in Trade Coefficients by the Waterway Transportation for the Service and Others

	Without Waterway			With Waterway			Percentage Change		
28. Contract construction	0.52174	0.41537	0.0	0.52178	0.41542	0.0	-.009	-.011	0.0
	0.47826	0.58463	0.0	0.47822	0.58458	0.0	0.010	0.008	0.0
	0.0	0.0	1.00000	0.0	0.0	1.00000	0.0	0.0	0.0
29. Transportation	0.44461	0.21922	0.0	0.44461	0.21922	0.0	0.001	0.001	0.0
	0.55539	0.78078	0.0	0.55539	0.78078	0.0	-.001	-.000	0.0
	0.0	0.0	1.00000	0.0	0.0	1.00000	0.0	0.0	0.0
30. Wholesale and retail trade	0.45278	0.40969	0.0	0.45277	0.40969	0.0	0.000	0.000	0.0
	0.54722	0.59031	0.0	0.54723	0.59031	0.0	-.000	-.000	0.0
	0.0	0.0	1.00000	0.0	0.0	1.00000	0.0	0.0	0.0
31. Finance, insurance & real estate	0.34150	0.28630	0.0	0.34151	0.28631	0.0	-.003	-.003	0.0
	0.32483	0.40710	0.0	0.32484	0.40712	0.0	-.003	-.003	0.0
	0.33367	0.30660	1.00000	0.33365	0.30658	1.00000	0.007	0.007	0.0
32. Communications, radio & TV broadcasting	0.59816	0.45755	0.0	0.59816	0.45755	0.0	-.000	-.000	0.0
	0.40184	0.54245	0.0	0.40184	0.54245	0.0	0.000	0.000	0.0
	0.0	0.0	1.00000	0.0	0.0	1.00000	0.0	0.0	0.0
33. Electric, gas & sanitary services	0.47727	0.45479	0.0	0.47726	0.45479	0.0	0.000	0.000	0.0
	0.52273	0.54521	0.0	0.52274	0.54521	0.0	-.000	-.000	0.0
	0.0	0.0	1.00000	0.0	0.0	1.00000	0.0	0.0	0.0
34. Hotel and other services	0.27540	0.26828	0.0	0.27545	0.26833	0.0	-.019	-.017	0.0
	0.31577	0.36269	0.0	0.31584	0.36275	0.0	-.020	-.018	0.0
	0.40883	0.36903	1.00000	0.40871	0.36892	1.00000	0.028	0.030	0.0
35. Government	0.32918	0.31718	0.0	0.32918	0.31718	0.0	0.000	0.000	0.0
	0.67082	0.68282	0.0	0.67082	0.68282	0.0	-.000	-.000	0.0
	0.0	0.0	1.00000	0.0	0.0	1.00000	0.0	0.0	0.0

APPENDIX II

Basic Supporting Data

APPENDIX II: BASIC SUPPORTING DATA

TABLE 1

Industrial Classification

The 35 industry classification		SIC Code in manufacturing sector		1972 I/O Transaction Table classification (OBE)	
		Agricultural Sector			
Code	Industry	Code	Industry	Code	Industry
01	Dairy farm products		Dairy products	10100	Dairy farm products
02	Poultry and eggs		Poultry and eggs	10200	Poultry and eggs
03	Meat animals & products		Meat animals	10301	Meat animals
			Misc. livestock	10302	Misc. livestock
04	Cotton		Cotton	20100	Cotton
05	Food and feed grains		Food grains	20201	Food grains
			Feed crops	20202	Feed grains
			Seed crops	20203	Grass seeds
06	Oil bearing crops		Oil crops	20600	Oil bearing crops
07	Misc. agricultural products				
	Fruits and nuts		Fruits and nuts	20401	Fruits
				20402	Tree nuts
	Vegetables & melons		Vegetables	20501	Vegetables
			All other crops	20502	Sugar crops
				20503	Misc. crops
	Misc. agricultural products, forestry & fishery		Greenhouse & nursery	20300	Tobacco
			Forest products	20701	Forestry products
			Tobacco	20702	Greenhouse & nursery products
				30000	Forestry & fishery products
				40000	Agricultural, forestry & fishery services

TABLE 1 (Continued)

Manufacturing Sector					
Code	Industry	Code	Industry	Code	Industry
08	Food and kindred prod.	20	Food and kindred prod.	140101	14. Food and kindred
		21	Tobacco Manufacture	150200	15. Tobacco manufacture
09	Apparel and textile prod.	22	Textile mill prod.	160100	16. Broad narrow fabrics
					17. *Misc. textile goods*
					18. Apparel
		23	Apparel, other textile	190306	19. Misc. fabricated textile
10	Lumber and wood prod.	24	Lumber and wood prod.	200100	20. Lumber and wood prod.
				210000	21. Wood container
11	Furniture and fixture	25	Furniture and fixture	220101	22. Household furniture
				230700	23. Other furniture
12	Paper and allied prod.	26	*Paper and allied prod.*	240100	24. Paper and allied prod.
				250000	25. Paper container and box
13	Printing and publishing	27	Printing and publishing	260100	26. Printing and publishing
				260805	
14	Chemicals and allied prod.	28	Chemicals and allied prod.	270100	27. Chemicals 28. Plastics
				300000	29. Drugs 30. Paints
15	Petroleum and allied prod.	29	Petroleum and coal prod.	310100	31. Petroleum refining and related industries
				310300	
16	Rubber	30	Rubber, Misc. plastic prod.	320100	32. Rubber and misc. plastic prod.
				320500	
17	Leather	31	Leather and leather prod.	330001	33. Leather tanning
				340305	34. Footwear and other
18	Stone, clay and glass	32	Stone, clay, glass prod.	350100	35. Glass prods.
				362200	36. Stone and clay prod.

TABLE 1 (Continued)

Manufacturing Sector (continued)

Code	Industry	Code	Industry	Code	Industry
19	Primary metal prod.	33	Primary metal prod.	370101 381400	37. Primary iron manufacture 38. Primary metal manufacture
20	Fabricated metal	34	Fabricated metal prod. (3482,3483,3484,3489, excluded)	390100 421100	39. Metal container 40. Heating 41. Screw machine 42. Other
21	Machinery except electrical	35	Machinery except electrical	430100 520500	43, 44, 45, 46, 47, 48, 49, 50, 51, 52
22	Electrical equipment	36	Electrical, electronic equip.	530100 580500	53, 54, 55, 56, 57, 58
23	Motor vehicle & transp. equip.	37	Transportation equip. (3761, 3795 excluded)	590100 610700	59, 60, 61
24	Misc. manufacturing	38	Instrument related prod.	620100 641200	62, 63, 64
		39	Misc. manufacturing		
		Included	3761, 3483, 3795, 3484, 3482, 3489.	130100 130700	13. Ordinance and accessories.

Service and Other Sector

Code	Industry	Code	Industry	Code	Industry
25	Bituminous coal		Coal mining	70000	Coal mining
26	Crude petroleum & natural gas		Oil and gas extraction	80000	Crude petroleum & natural gas
27	Other mining except petroleum, gas & coal		Metal mining	50000	Iron and ferroalloy ores mining
			Nonmetalic mineral, except fuels	60100	Copper ore mining
				60200	Nonferrous metal ores mining, except copper
				90000	Stone & clay mining and quarrying
				100000	Chemical & fertilizer mineral mining

TABLE 1 (Continued)

Service and Other Sector (Continued)

Code	Industry	Code	Industry	Code	Industry
28	Contract construction		Construction	110101	New construction
				110508	
				120100	Maintenance & repair construction
				120216	
29	Transportation				
	Railroads & related services		Railroad transportation	650100	Reailroads & related services
	Motor freight transportation		Trucking & warehousing	650300	Motor freight transportation & warehousing
	Water transportation		Water transportation	650400	Water transportation
	Other transportation		Other transportation	650200	Local, suburban, & interurban highway passenger transportation
				650500	Air transportation
				650600	Pipeline, except natural gas
				650700	Transportation services
30	Wholesale & retail trade		Wholesale trade	690100	Wholesale trade
			Retail trade	690200	Retail trade
31	Finance, insurance & real estate		Finance, insurance & real estate	700100	
				700500	Finance & insurance
				710100	
				710200	Real estate & rental
32	Communications, radio and TV broadcasting		Communication	660000	Communications, except radio and TV
				670000	Radio & TV broadcasting

TABLE 1 (Continued)

Service and Other Sector (Continued)					
Code	Industry	Code	Industry	Code	Industry
33	Electric, gas & sanitary services		Electrical, gas & sanitary services	680100 680300	Electric, gas, water and sanitary services
34	Hotel and other services		Services	720100 720300	Hotels and lodging, personal and repair services
				730100 730300	Business services
				740000	Eating & drinking places
				750000	Automobile repair & services
				760100 760200	Amusements
				770100 770900	Health, educational & social services and non-profit organizations
35	Government		Gross goverment product	780100 780400	Federal gov't. enterprises
				790100 790300	State and local gov't enterprise
				820000	Government industry

TABLE 2

State Shares of Outputs and Values Added
(Oklahoma and Arkansas)

35 Ind. Code	Industry	Output		Value Added	
		OK/US	ARK/US	OK/US	ARK/US
1.	Dairy farm products	0.026064	0.006347	0.007801	0.005647
2.	Poultry and eggs	0.009007	0.102426	0.005442	0.091364
3.	Meat animals & products	0.026064	0.006347	0.030015	0.008300
4.	Cotton	0.015938	0.105752	0.015938	0.105752
5.	Food and feed grains	0.016264	0.025523	0.016525	0.016008
6.	Oil bearing crops	0.007349	0.056286	0.007349	0.056286
7.	Miscellaneous Agricultural products				
	Fruits and nuts	0.000815	0.002437	0.000815	0.002437
	Vegetables and melons	0.001923	0.003460	0.001923	0.003460
	Misc. agricultural products, forestry & fishery	0.009865	0.005450	0.002542	0.003050
8.	Food and Kindred products	0.007651	0.013292	0.006264	0.009498
9.	Apparel and textile products	0.004183	0.006413	0.003980	0.007547
10.	Lumber and wood products	0.006735	0.025263	0.006848	0.026217
11.	Furniture and fixture	0.003843	0.022588	0.003625	0.021682
12.	Paper and allied products	0.004193	0.020031	0.003490	0.018746
13.	Printing and publishing	0.006329	0.005440	0.006482	0.005839
14.	Chemical and allied products	0.001034	0.004684	0.001016	0.004069
15.	Petroleum and allied products	0.030685	0.004377	0.017970	0.005990
16.	Rubber	0.012947	0.010672	0.011928	0.010675
17.	Leather	0.001915	0.024578	0.002104	0.028315
18.	Stone, clay and glass products	0.012908	0.007341	0.014222	0.00753
19.	Primary metal products	0.002826	0.005814	0.003945	0.00479
20.	Fabricated metal	0.008690	0.007183	0.008809	0.00680
21.	Machinery except electrical	0.013216	0.003616	0.012683	0.00357
22.	Electrical equipment	0.006469	0.011775	0.006619	0.01112

TABLE 2

(continued)

Ind. de	Industry	Output		Value Added	
		OK/US	ARK/US	OK/US	ARK/US
23.	Motor vehicle & transp. equip.	0.005293	0.004004	0.004083	0.002548
24.	Misc. manufacturing	0.002759	0.008162	0.002440	0.007547
25.	Bituminous coal	0.004189	0.000923	0.004260	0.000923
26.	Crude petroleum & natural gas	0.063629	0.004514	0.062048	0.004514
27.	Other mining except petroleum, gas and coal	0.008597	0.011482	0.004813	0.011482
28.	Contract construction	0.009332	0.006058	0.009332	0.006058
29.	Transportation				
	Railroad and related service	0.007848	0.012942	0.007848	0.012942
	Motor freight transportation	0.012953	0.008087	0.012953	0.008087
	Water transportation	-	0.000456	-	0.000456
	Other transportation	0.017442	0.002326	0.017442	0.002326
30.	Wholesale & retail trade	0.010084	0.006269	0.010084	0.006269
31.	Finance, insurance & real estate	0.009540	0.005758	0.009540	0.005758
32.	Communications, radio and TV broadcasting	0.009562	0.005661	0.009562	0.005661
33.	Electric, gas & sanitary services	0.012710	0.007604	0.012710	0.007604
34.	Hotel and other services	0.009252	0.005422	0.009252	0.005422
35.	Government	0.012871	0.005821	0.012871	0.005821

(TABLE 2-1)

Market Value of Agricultural Products Sold: 1974
(U.S., Oklahoma and Arkansas)

(Unit: $1000)

35 Ind. Code	Industry	US	OK	ARK
5	Crops and hay	40,080,911	651,882	1,023,003
7	Nursery and greenhouse products	1,709,454	18,419	4,352
7	Forest products	231,910	733	6,229
1,3	Livestock and livestock products	33,301,559	867,968	211,356
2	Poultry and poultry products	6,207,191	55,911	635,778
	Agricultural products sold	81,531,026	1,594,913	1,880,719

Source: U.S. Dept. of Commerce, Bureau of The Census, 1974 Census of Agriculture, U.S. p. II-11.

(TABLE 2-2)

Values Added in Agricultural Sector, 1972
(U.S., Oklahoma and Arkansas) (Unit: Million Dollars)

35 Ind. Code	Industry	US	OK	ARK
	Livestock products	18,027.44	408.76	317.63
3	Meat animals	12,111.22	366.46	98.27
1	Dairy products	3,593.10	28.03	20.29
2	Poultry and eggs	2,137.27	11.63	195.27
3	Misc. livestock	185.85	2.64	3.80
	Crops	12,947.55	120.04	316.37
5	Food grains	1,765.57	57.64	69.11
5	Feed crops	2,973.60	21.68	8.24
5	Seed crops	92.93	0.53	-
4	Cotton	929.25	14.81	98.27
6	Oilcrops	2,230.20	16.39	125.53
7	Vegetables	1,672.65	2.64	7.61
7	Greenhouse and nursery	557.55	3.70	1.90
7	Fruits and nuts	1,300.95	1.06	3.17
7	Forest products	154.88	-	2.54
7	Tobacco	743.40	-	-
7	All other crops	526.57	1.59	-
	Total	30,974.99	528.80	634.00

Source: U.S. Dept. of Agriculture, Economic Research Service, State Farm Income Statistics, Supplement to Statistical Bulletin No. 547, Sept. 1975 "Cash Receipts by Agricultural Commodities, 1972".

(TABLE 2-3)

Value of Shipments in Manufacturing Sector, 1972
(U.S., Oklahoma and Arkansas)

(Unit: Million dollars)

35 Ind. Code	Industry	US	OK	ARK
8.	Food and kindred products	115,051.5	925.6	1,608.0
8.	Tobacco	5,920.2	—	—
9.	Textile mill products	28,063.9	86.4	150.8
9.	Apparel, other textile products	27,809.2	147.3	207.5
10.	Lumber and wood products	23,829.7	160.5	602.0
11.	Furniture and fixture	11,320.3	43.5	255.7
12.	Paper and allied products	28,261.9	118.5	566.1
13.	Printing and publishings	30,146.4	190.8	164.0
14.	Chemicals and allied products	57,349.6	—	268.6
15.	Petroleum and coal products	28,694.7	880.5	125.6
16.	Rubber, misc. plastic products	20,923.7	270.9	223.3
17.	Leather and leather products	5,769.5	—	141.8
18.	Stone, clay, glass products	21,537.5	278.0	158.1
19.	Primary metal industries	58,429.7	—	339.7
20.	Fabricated metal products	51,739.3	425.4	351.6
21.	Machinery except electrical	65,820.7	869.9	238.0
22.	Electric, electronic equipments	53,394.3	345.4	628.7
23.	Transportation related products	94,704.9	271.9	205.7
24.	Instruments related products	15,526.7	—	—
24.	Misc. manufacturing industries	12,173.2	—	—

Sources: U.S. Department of Commerce, Social and Economic Statistics Administration, Bureau of the Census, 1972 Census of Manufactures, Vol. III. Part 1 pp.6-21, 4-7-11, Part 2 pp. 37-7-10.

(TABLE 2-4)

Values Added in Manufacturing Sector, 1972
(U.S., Oklahoma and Arkansas)

(Unit: Million dollars)

35 Ind. Code	Industry	US	OK	ARK
8.	Food and kindred products	35,614.8	239.6	363.3
8.	Tobacco	2,637.2	—	—
9.	Textile mill products	11,715.8	23.6	63.8
9.	Apparel, other textile products	13,487.5	76.7	126.4
10.	Lumber and wood products	10,310.2	70.6	270.3
11.	Furniture and fixture	6,097.1	22.1	132.2
12.	Paper and allied products	13,064.1	45.6	244.9
13.	Printing and publishings	20,209.5	131.0	118.0
14.	Chemicals and allied products	32,413.9	—	131.9
15.	Petroleum and coal products	5,793.1	104.1	34.7
16.	Rubber, misc. plastic products	11,653.3	139.0	124.4
17.	Leather and leather products	2,917.2	—	82.6
18.	Stone, clay, glass products	12,586.5	179.0	94.8
19.	Primary metal industries	23,258.1	—	111.6
20.	Fabricated metal products	26,945.8	224.1	173.1
21.	Machinery except electrical	37,562.9	476.4	134.2
22.	Electric, electronic equipments	30,558.2	202.4	340.3
23.	Transportation related products	39,799.4	150.0	93.6
24.	Instruments related products	10,580.1	—	—
24.	Misc. manufacturing industries	6,768.7	—	—

Sources: The same as those of (Table 2-3)

(TABLE 2-5)

Value of Production in Mining Sector, 1972
(U.S., Oklahoma and Arkansas)

(Unit: $1000)

35 Ind. Code	Industry	US	OK	ARK
25.	Coal	4,561,983	19,112	4,676
26.	Oil, gas & liquid	17,339,205	1,103,276	89,417
27.	Other mining	10,283,812	88,340	147,086

Source: Bureau of The Census, U.S. Dept. of Commerce, 1972 Census of Mineral Industries, pp. 1-4,6,12,13.

(TABLE 2-6)

Values Added in Mining Sector, 1972
(U.S., Oklahoma and Arkansas)

(Unit: Million dollars)

35 Ind. Code	Industry	US	OK	ARK
25.	Coal	3,685.4	15.7	3.4
26.	Oil, gas & liquid	17,612.1	1,092.8	79.5
27.	Ocher mining	5,173.1	24.9	59.4

Source: The same as that of (TABLE 2-5).

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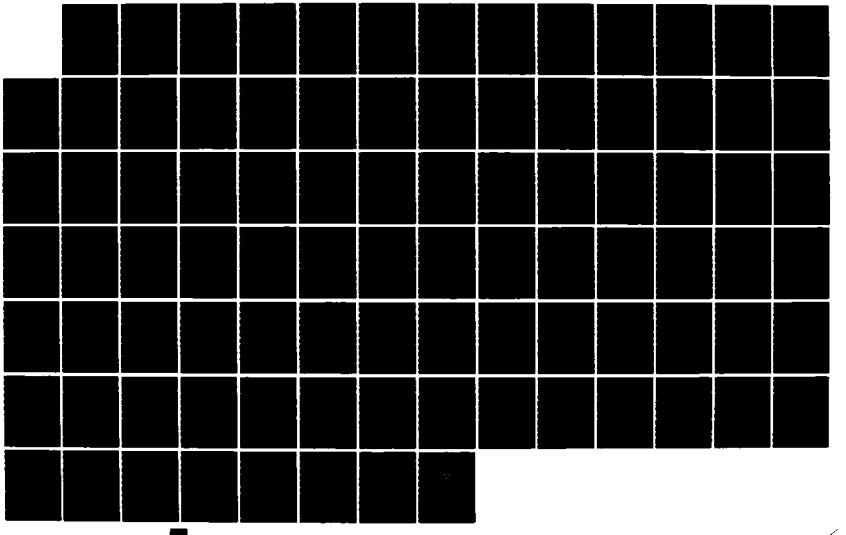

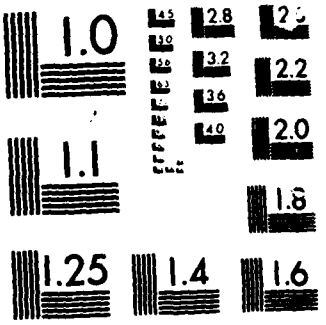

(TABLE 2-7)

Values Added in Service and Other Sectors, 1972
(U.S., Oklahoma and Arkansas) (Unit: Million dollars)

35 Ind. Code	Industry	US	OK	ARK
28.	Construction	56,600	528.1778	342.8945
29.	Transportation			
	Railroad transportation	10,300	80.8323	133.3024
	Trucking and warehousing	19,400	251.2939	156.8771
	Water transportation	3,200	—	1.4628
	Other transportation	13,300	231.9786	30.9305
32.	Communication	29,400	281.1148	166.4199
33.	Electrical, gas, and sanitary services	28,000	355.8842	212.8950
30.	Wholesale trade	82,400	760.6257	415.8318
30.	Retail trade	118,800	1,268.2631	845.5087
31.	Finance, insurance, and real estate	168,600	1,608.3725	970.8570
34.	Services	134,500	1,244.3378	729.3169
35.	Gross government product	147,759.91	1,901.84	860.04

Sources : Chong K. Liew and Chung J. Liew, Regional Economic Development Impact Model: Phase I Study (Final Report), pp.117-139.

TABLE 3

Regional Shares of Outputs and Values Added
(Oklahoma and Arkansas)

35 Ind. Code	Industry	OK Water / OK	ARK Water / ARK
1.	Dairy farm products	0.138768	0.272705
2.	Poultry and eggs	0.146680	0.212421
3.	Meat animals & products	0.142163	0.222682
4.	Cotton	0.028173	0.192195
5.	Food and feed grains	0.030475	0.279234
6.	Oil bearing crops	0.171337	0.197402
7.	Miscellaneous Agricultural products		
	Fruits and nuts	——	——
	Vegetables and melons	——	——
	Misc., forestry and fishery	0.133320	0.232461
8.	Food and kindred products	0.273079	0.590979
9.	Apparel and textile products	0.234562	0.333333
10.	Lumber and wood products	0.073035	0.244761
11.	Furniture and fixture	0.488837	0.672897
12.	Paper and allied products	0.280000	0.666667
13.	Printing and publishing	0.383146	0.701149
14.	Chemical and allied products	0.274878	0.093378
15.	Petroleum and allied products	0.754413	0.208333
16.	Rubber	0.388496	0.558824
17.	Leather	0.312500	0.185185
18.	Stone, clay and glass products	0.400883	0.719047
19.	Primary metal products	0.934807	0.310345
20.	Fabricated metal	0.665251	0.778503
21.	Machinery except electrical	0.544149	0.650231
22.	Electrical equipment	0.428571	0.837088
23.	Motor vehicle & transp. equip.	0.576154	0.962453
24.	Misc. manufacturing	0.770789	0.600403

TABLE 3

(continued)

35 Ind. Code	Industry	OK Water OK	ARK Water ARK
25.	Bituminous coal	0.782597	1.0
26.	Crude petroleum & natural gas	0.105474	0.175926
27.	Other mining except petroleum, gas and coal	0.179975	0.125954
28.	Contract construction	0.327935	0.669043
29.	Transportation		
	Railroad and related service	0.461180	0.397059
	Motor freight transportation	0.250531	0.535507
	Water transportation	—	—
	Other transportation	0.188164	0.875003
30.	Wholesale & retail trade	0.344962	0.555646
31.	Finance, insurance & real estate	0.323652	0.652961
32.	Communications, radio and TV broadcasting	0.365908	0.763023
33.	Electric, gas & sanitary services	0.405817	0.559776
34.	Hotel and other services	0.361670	0.572968
35.	Government	0.287624	0.395027

(TABLE 3-1)

Agricultural Production in Oklahoma Water Region, 1972

	Unit	Water	State	Water/State
1. Milk cow	(Number)	19,150	138,000	0.138768
2. Broiler	(Number)	751,529	5,123,587	0.146680
3. All cattle and calves	(Number)	849,000	5,972,000	0.142163
4. Cotton	(1000 Bales)	9.3	330.1	0.028173
5. Wheat, Sorghum, Corn, Barley	(Dollars)	7,295,645.0	239,397,000.8	0.030475
6. Peanut, Soybean	(Dollars)	8,385,680.0	48,942,611.2	0.171337

Source: Oklahoma Crop and Livestock Reporting Service, Oklahoma Agriculture, 1973, pp. 30-33, 48-59, 64-67, 78-81.

(TABLE 3-2)

Agricultural Production in Arkansas Water Region, 1972

	Unit	Water	State	Water/State
1. Milk cow	(Number)	20,283	74,377	0.272705
2. Broiler	(Number)	18,847,984	88,729,568	0.212421
3. All cattle and calves	(Number)	436,396	1,959,725	0.222682
4. Cotton	(Bales)	275,800	1,435,000	0.192195
5. Rice	(100 lbs)	6,126,100	21,938,912	0.279234
6. Soybean	(Bushels)	15,989,500	80,999,824	0.197402

Source: Arkansas Crop and Livestock Reporting Service.

(TABLE 3-3)

Regional Output in Agricultural Sector, 1972
(Water and Non-water Regions of Oklahoma and Arkansas)
(Unit: Millions of dollars)

35 Ind. Code	Industry		OK Water	OK Non-Water	ARK Water	ARK Non-Water
1.	Dairy farm products	Value	27.156	168.535	12.995	34.658
		Share	0.138768	0.861232	0.272705	0.727295
2.	Poultry and eggs	Value	5.628	32.740	92.680	343.624
		Share	0.146680	0.853320	0.212421	0.787579
3.	Meat animals and products	Value	116.982	705.887	44.621	155.760
		Share	0.142163	0.857837	0.222682	0.777318
4.	Cotton	Value	0.940	32.420	42.542	178.807
		Share	0.028173	0.971827	0.192195	0.807805
5.	Food and feed grains	Value	8.827	280.814	126.920	327.611
		Share	0.030475	0.969525	0.279234	0.720766
6.	Oil bearing crops	Value	6.042	29.222	53.316	216.773
		Share	0.171337	0.828663	0.197402	0.802598
	Total	Value	165.575	1,249.618	373.074	1,257.233
		Share[1]	0.136223	0.885550	0.234025	0.772702

[1]This share represents a weighted average of 6 shares. For example,

$$0.136223 = 0.138768\left(\frac{27.156}{165.575}\right) + 0.146680\left(\frac{5.628}{165.575}\right) + 0.142163\left(\frac{116.982}{165.575}\right)$$
$$+ 0.028173\left(\frac{0.940}{165.575}\right) + 0.030475\left(\frac{8.827}{165.575}\right) + 0.171337\left(\frac{6.042}{165.575}\right)$$

[2]Regional output shares in Miscellaneous Agricultural Products (7) can be estimated as follows.

OK Water: $\frac{0.136223}{0.136223 + 0.885550} = 0.133320$

ARK Water: $\frac{0.234025}{0.234025 + 0.772702} = 0.232461$

(TABLE 3-4)

Values and Ratios of Mineral Production in Water County and Non-water County

Oklahoma

35 Industry Code	Industry	Value of Production in Water County ($1000)	Value of Production in Non-water County ($1000)	Value of Production in Oklahoma State ($1000)	Ratios	
					Water/State	Non-water/Stat
25	Bituminous Coal	14,957	4,155	19,112	0.782597	0.217403
26	Crude Petroleum Natural Gas and Liquids	116,367	986,909	1,103,276	0.105474	0.894526
27	Other Mining Except Petroleum Gas and Coal	15,899	72,441	88,340	0.179975	0.820025
	TOTAL	147,223	1,063,505	1,210,728	0.121599	0.878401

Source: Bureau of Mines, U.S. Department of the Interior, Mineral Yearbook 1972, Volume I, p. 352, Volume II, p. 551-2.
Unpublished Data of 1972 Oklahoma Oil and gas productions by county, Oklahoma Tax Commission.

Arkansas

35 Industry Code	Industry	Value of Production in Water County ($1000)	Value of Production in Non-water County ($1000)	Value of Production in Arkansas State ($1000)	Ratios	
					Water/State	Non-water/Stat
25	Bituminous Coal	4,676	0	4,676	1.0	0.0
26	Crude Petroleum Natural Gas and Liquids	15,731	73,686	89,417	0.175926	0.824074
27	Other Mining Except Petroleum Gas and Coal	18,526	128,560	147,086	0.125954	0.874046
	TOTAL	38,933	202,246	241,179	0.161428	0.838572

Source: Bureau of Mines, U.S. Department of the Interior, Mineral Yearbook, 1972, Vol. I, p. 347, Vol. II, pp. 98-99, 104.
Bureau of the Census, U.S. Department of Commerce, 1972 Census of Mineral Industries; Area Series (West-Southern Central States), p.23.
Bureau of Labor Statistics, U.S. Department of Labor, Handbook of Labor Statistics 1977, p.267.

TABLE 4

Industrial Classification for Price Indexes

Ind. Code	The 35-Industry Classification	Reference Classification	Reference Code
1	Dairy farm products	Fluid milk[1]	01-6
2	Poultry and eggs	Live poultry[1]	01-4
3	Meat animals and products	Livestock[1]	01-3
4	Cotton	Cotton[2]	
5	Food and feed grains	Grains[1]	01-2
6	Oil bearing crops	Peanuts[2]	
7	Misc. agricultural products		
	Fruits and nuts	Fresh and dried fruits and vegetables[1]	01-1
	Vegetables and melons	Fresh and dried fruits and vegetables[1]	01-1
	Misc. agricultural products, forestry and fishery	Fresh and dried fruits and vegetables[1]	01-1
8	Food and kindred products	Processed foods and feeds[1]	02
9	Apparel and textile products	Textile products and apparel[1]	03
10	Lumber and wood products	Lumber and wood products[1]	08
11	Furniture and fixture	Furniture and household durables[1]	12
12	Paper and allied products	Pulp, paper, and allied products[1]	09
13	Printing and publishing	Magazine, single copy and subscription[5]	
14	Chemical and allied products	Chemicals and allied products[1]	06
15	Petroleum and allied products	Refinery[4]	
16	Rubber	Rubber and plastic products[1]	07
17	Leather	Hides, skins, leather, and related products[1]	04
18	Stone, clay and glass products	Nonmetalic mineral products[1]	13
19	Primary metal products	Metals and metal products[1]	10
20	Fabricated metal	Fabricated structural metal products[1]	10-7

TABLE 4 (Continued)

Ind. Code	The 35-Industry Classification	Reference Classification	Reference Code
21	Machinery except electrical	Machinery and equipment[1]	11
22	Electrical equipments	Electrical machinery and equipment[1]	11-7
23	Motor vehicle and transportation equipment	Transportation equipment[1]	14
24	Misc. Manufacturing	Misc. products[1]	15
25	Bituminous coal	Bituminous coal and lignite[3]	1211
26	Crude petroleum and natural gas	Crude petroleum and natural gas[3]	1311
27	Other mining except petroleum, gas and coal	Construction sand and gravel[3]	1442
28	Contract construction	Nonmetalic mineral products[1]	13
29	Transportation		
	Railroads and related service	Transportation, public[5]	
	Motor freight transportation	Transportation, public[5]	
	Water transportation	Transportation, public[5]	
	Other transportation	Transportation, public[5]	
30	Wholesale and retail trade	All items[6]	
31	Finance, insurance and real estate	Bank service charges, checking accounts[5]	
32	Communications, radio and TV broadcasting	Reading and recreation[5]	
33	Electric, gas and sanitary services	Gas and electricity[5]	
34	Hotel and other services	Other goods and services[5]	
35	Government	All items[6]	

TABLE 5

Industrial Price Indexes, 1967-1978

Ind. Code	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
1	100.0	105.8	110.7	115.3	118.8	122.2	145.0	172.8	180.2	201.2	202.6	219.7
2	100.0	103.7	112.8	99.5	100.1	104.0	179.5	157.4	189.8	166.9	175.4	199.8
3	100.0	103.7	117.0	116.7	118.3	142.5	190.4	170.6	187.9	173.3	173.0	220.1
4[A]	21.17	19.67	19.73	20.00	28.37	25.90	49.50	29.90	47.20	61.10	46.60	53.90
5	100.0	88.8	90.3	98.8	100.9	102.9	183.6	257.9	223.9	205.9	165.2	182.5
6[A]	10.7	11.7	12.2	12.2	13.4	14.0	16.0	17.2	19.2	20.9	21.4	21.2
7												
	100.0	106.6	110.0	111.6	120.1	127.6	168.1	192.3	183.7	178.4	192.2	216.5
	100.0	106.6	110.0	111.6	120.1	127.6	168.1	192.3	183.7	178.4	192.2	216.5
	100.0	106.6	110.0	111.6	120.1	127.6	168.1	192.3	183.7	178.4	192.2	216.5
8	100.0	102.2	107.3	112.1	114.5	120.8	148.1	170.9	182.6	178.0	186.1	202.6
9	100.0	103.7	106.0	107.1	109.0	113.6	123.8	139.1	137.9	148.2	154.0	159.8
10	100.0	113.3	125.3	113.6	127.3	144.3	177.2	183.6	176.9	205.6	236.2	276.0
11	100.0	102.3	104.9	107.5	110.0	111.4	115.2	127.9	139.7	145.6	151.4	160.4
12	100.0	101.1	104.0	108.2	110.1	113.4	122.1	151.7	170.4	179.4	186.4	195.6
13[B]	100.0	105.0	111.8	117.9	125.1	131.4	135.2	138.0	164.2	185.1	201.5	106.1
14	100.0	99.8	99.9	102.2	104.1	104.2	110.0	146.8	181.3	187.2	192.7	198.8
15[C]	4.85	4.57	4.73	4.78	4.89	4.86	5.85	11.34	12.36	12.53	13.24	13.87
16	100.0	103.4	105.3	108.3	109.1	109.3	112.4	136.2	150.2	159.2	167.5	174.8
17	100.0	103.2	108.9	110.3	114.1	131.3	130.2	145.1	148.5	167.8	179.5	200.0
18	100.0	103.7	107.7	112.9	122.4	126.1	132.8	153.2	174.0	186.3	200.4	222.8
19	100.0	102.6	108.5	116.6	118.7	123.5	132.8	171.9	185.6	195.9	209.0	227.1
20	100.0	102.2	105.9	112.0	118.1	122.4	127.4	161.2	189.0	193.8	206.8	226.4
21	100.0	103.2	106.5	111.4	115.5	117.9	121.7	139.4	161.4	171.0	181.7	196.1

TABLE 5 (Continued)

Ind. Code	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
22	100.0	101.3	102.9	106.4	109.2	110.4	112.4	125.0	140.7	146.7	154.1	164.9
23[D]		102.8	100.8	104.6	110.3	113.7	115.1	125.5	141.5	151.1	161.3	173.5
24	100.0	102.2	105.2	109.9	112.9	114.6	119.7	133.1	147.7	153.7	164.4	184.3
25	100.0	103.5	112.2	151.9	185.2	197.4	222.5	339.6	387.2	367.7	388.7	430.2
26	100.0	101.0	104.8	106.1	114.3	115.4	127.2	199.8	239.4	266.8	317.0	358.2
27	100.0	104.6	108.8	115.3	120.8	123.3	127.6	139.1	157.0	167.4	178.7	194.6
28	100.0	103.7	107.7	112.9	122.4	126.1	130.2	153.2	174.0	186.3	200.4	222.8
29[E]												
	100.0	104.6	112.7	128.5	137.7	143.4	144.8	148.0	158.6	174.2	182.4	188.2
	100.0	104.6	112.7	128.5	137.7	143.4	144.8	148.0	158.6	174.2	182.4	188.2
	100.0	104.6	112.7	128.5	137.7	143.4	144.8	148.0	158.6	174.2	182.4	188.2
	100.0	104.6	112.7	128.5	137.7	143.4	144.8	148.0	158.6	174.2	182.4	188.2
30	100.0	104.2	109.8	116.3	121.3	125.3	133.1	147.7	161.2	170.5	181.5	199.3
31	100.0	103.2	104.1	107.2	110.6	107.5	106.3	105.0	119.2	127.3	133.5	156.5*
32	100.0	104.7	108.7	113.4	119.3	122.8	125.9	133.8	144.4	151.2	157.9	104.4
33	100.0	100.9	102.8	107.3	114.7	120.5	126.4	145.8	169.6	189.0	213.4	237.9
34	100.0	104.6	109.1	116.0	120.9	125.5	129.0	137.2	147.4	153.3	159.2	187.8
35	100.0	104.2	109.8	116.3	121.3	125.3	133.1	147.7	161.2	170.5	181.5	199.3

Footnotes for Tables 4 and 5

1. Source: U.S. Department of Labor, Bureau of Labor Statistics, Handbook of Labor Statistics, 1978, Table 127, pp. 437-454. Monthly Labor Review, Dec. 1979, pp. 94-95.

2. Source: Oklahoma Crop and Livestock Reporting Service, Oklahoma Agricultural Statistics, 1978, 1977, 1976, 1978: p. 88, 1977: p. 90, 1976: p. 101.

3. Source: U.S. Department of Labor, Bureau of Labor Statistics, Handbook of Labor Statistics, 1978, Table 129, pp. 456-465. Monthly Labor Review, Dec. 1979, pp. 96-98.

4. Source: Chong K. Liew and Chung J. Liew, Oklahoma Energy Assessment and Forecasting: An Application of the Variable Input-Output Model, p. 76.

5. Source: U.S. Department of Labor, Bureau of Labor Statistics, Handbook of Labor Statistics, 1978, Table 122, pp. 415-426. Monthly Labor Review, Dec. 1979, pp. 87-90.

6. Source: U.S. Department of Labor, Bureau of Labor Statistics, Handbook of Labor Statistics, 1978, Table 117 p. 398. Monthly Labor Review, Dec. 1979, p. 85.

A. Cents per pound
1978 value: forecast

B. 1978 value: '78 Sept. (12/77 = 100)

C. Dollars per barrel
1978 value: forecast

D. (12/68 = 100)

E. 1978 value: '78 Sept.

* Due to change of classification into "Insurance and Finance" in April 1978, 1978 value is estimated as follows:

$$\text{1977 value} \times \frac{\text{1979 Sep. price index of "Insurance and Finance"}}{\text{1978 Sep. price index of "Insurance and Finance"}} = \text{1978 value}$$

$$(133.5 \times \frac{283.5}{241.9} = 156.5)$$

TABLE 6
Industrial Classification for Wage Indexes

Ind. Code	The 35-Industry Classification	Reference	
		Classification	Code
1	Dairy farm products	Farm wage rates[1]	
2	Poultry and eggs		
3	Meat animals and products		
4	Cotton		
5	Food and feed grains		
6	Oil bearing crops		
7	Misc. agricultural products		
	Fruits and nuts		
	Vegetables and melons		
	Misc. agricultural products, forestry and fishery		
8	Food and kindred products	Food and kindred products[2]	1972 SIC 20
9	Apparel and textile products	Apparel and other textile products[2]	23
10	Lumber and wood products	Lumber and wood products[2]	24
11	Furniture and fixtures	Furniture and fixtures[2]	25
12	Paper and allied products	Paper and allied products[2]	26
13	Printing and Publishing	Printing and publishing[2]	27
14	Chemical and allied products	Chemicals and allied products[2]	28
15	Petroleum and allied products	Petroleum and coal products[2]	29
16	Rubber	Rubber and misc. plastic products	30
17	Leather	Leather and leather products[2]	31
18	Stone, clay and glass products	Stone, clay and glass products[2]	32
19	Primary metal products	Primary metal industries[2]	33
20	Fabricated metal	Fabricated metal products[2]	34

TABLE 6 (Continued)

Ind. Code	The 35-Industry Classification	Reference Classification	Reference Code
21	Machinery except electrical	Machinery except electrical[2]	35
22	Electrical equipments	Electric and electronic equipment[2]	36
23	Motor vehicle & transp. equip.	Transportation equipment[2]	37
24	Misc. Manufacturing	Misc. manufacturing industries[2]	39
25	Bituminous coal	Bituminous coal and lignite mining[2]	12
26	Crude petroleum & natural gas	Crude petroleum, natural gas, & natural gas liquids	131,2
27	Other mining except petroleum, gas and coal	Nonmetalic minerals, except fuels[2]	14
28	Contract construction	Construction[2]	--
29	Transportation		
	Railroads and related service		
	Motor freight transportation	Trucking and warehousing[2]	42
	Water transportation		
	Other transportation		
30	Wholesale and retail trade	Wholesale and retail trade[2]	--
31	Finance, insurance & real estate	Finance, insurance, and real estate[2]	--
32	Communications, radio and TV broadcasting	Communication[2]	48
33	Electric, gas & sanitory services	Electric, gas, and sanitary services[2]	49
34	Hotel and other services	Hotels and other lodging places[2]	701
35	Government	Government employment and payrolls[3]	

TABLE 7
Wage Rates by Industry, 1967-1978

Ind. Code	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
1-7	1.33	1.44	1.55	1.64	1.73	1.84	2.00	2.25	2.43	2.66	2.87	3.16[A]
8	2.64	2.80	2.95	3.16	3.38	3.60	3.83	4.15	4.57	4.96	5.34	5.80
9	2.03	2.21	2.31	2.39	2.49	2.61	2.78	2.99	3.19	3.41	3.62	3.94
10	2.38	2.56	2.73	2.96	3.14	3.31	3.58	3.91	4.28	4.71	5.06	5.61
11	2.32	2.47	2.62	2.77	2.90	3.06	3.26	3.49	3.75	3.98	4.30	4.68
12	2.87	3.05	3.24	3.44	3.68	3.94	4.19	4.50	4.99	5.43	5.92	6.52
13	3.28	3.48	3.69	3.92	4.02	4.48	4.68	4.96	5.36	5.69	6.09	6.47
14	3.10	3.26	3.47	3.69	3.94	4.20	4.47	4.85	5.37	5.89	6.39	7.01
15	3.58	3.75	4.01	4.27	4.58	4.95	5.22	5.63	6.42	7.14	7.72	8.60
16	2.75	2.92	3.07	3.20	3.41	3.60	3.80	4.03	4.35	4.62	5.12	5.50
17	2.07	2.23	2.36	2.49	2.59	2.71	2.81	3.01	3.23	3.44	3.64	3.90
18	2.83	3.00	3.18	3.40	3.66	3.91	4.18	4.52	4.89	5.29	5.76	6.32
19	3.34	3.55	3.79	3.94	4.23	4.66	5.03	5.60	6.17	6.80	7.45	8.20
20	2.97	3.17	3.33	3.53	3.74	3.99	4.24	4.59	5.04	5.43	5.84	6.34
21	3.18	3.37	3.58	3.77	3.99	4.27	4.55	4.92	5.36	5.76	6.20	6.76
22	2.78	2.93	3.09	3.29	3.50	3.67	3.86	4.15	4.58	4.91	5.34	5.83
23	3.44	3.69	3.90	4.07	4.44	4.73	5.07	5.47	6.02	6.54	7.18	7.91
24	2.35	2.50	2.65	2.83	2.96	3.11	3.27	3.50	3.79	4.01	4.34	4.69
25	3.75[B]	3.83[B]	4.21	4.57	4.85[B]	5.34[B]	5.74[B]	6.24	7.23[B]	7.91[B]	8.46[B]	9.57[B]
26	3.31	3.38	3.59	3.83	4.16	4.46	4.69	5.33	6.05	6.59	7.13	8.05
27	2.84	3.03	3.27	3.48	3.68	3.95	4.24	4.52	4.91	5.38	5.84	6.31

TABLE 7 (Continued)

Ind. Code	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
28	4.09	4.38	4.78	5.22	5.72	6.06	6.47	6.76	7.25	7.68	8.04	8.65
29	3.31	3.42	3.63	3.85	4.36	4.82	5.26	5.65	6.05	6.43	6.92	7.75
30	2.25	2.40	2.56	2.71	2.87	3.02	3.20	3.47	3.75	3.97	4.28	4.66
31	2.61	2.76	2.92	3.07	3.28	3.45	3.61	3.81	4.13	4.36	4.60	4.90
32	3.02	3.11	3.29	3.41	3.68	4.26	4.63	5.08	5.70	6.34	6.84	7.33
33	3.44	3.63	3.88	4.15	4.47	4.83	5.14	5.48	5.99	6.56	7.05	7.64
34	1.55	1.65	1.81	1.96	2.12	2.26	2.39	2.62	2.81	3.03	3.27	3.62
35	510.32	558.18	598.11	639.70	669.19	723.16	779.90	826.77	883.12	927.52	986.43	1,054.51

Footnotes for TABLES 6 and 7

1. Source: U.S. Department of Agriculture, Agricultural Statistics, 1978, 1977, 1975. (1978: p. 434, 1977: p. 439, 1975: p. 433)

2. Source: U.S. Department of Labor, Bureau of Labor Statistics, Employment and Earnings, Marches 1968-1979, C-2 (Gross hours and earnings by industry), pp. 90-105 for 1979.

3. Source: U.S. Department of Labor, Bureau of Labor Statistics, Handbook of Labor Statistics, 1978, p. 151. (for data in 1967-77). U.S. Department of Commerce, Bureau of the Census, Public Employment in 1978, p. 7. (for data in 1978).

   A. $2.87 \times \frac{211.4}{192.2} = 3.16$

   $$(\text{1977 Wage rate}) \times \frac{(\text{1978 CPI for Food})}{(\text{1977 CPI for Food})}$$

   Source: Economic Indicators, Jan. 1980, U.S. Government Printing Office, Washington: 1980, p. 23. (Consumer Price Indexes for Food)

   B. 11-month average

(TABLE 7-1)

Farm Wage Rates

	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
U.S.	1.33	1.44	1.55	1.64	1.73	1.84	2.00	2.25	2.43	2.66	2.87	
Oklahoma								2.02	2.42	2.36	2.69	
Arkansas								2.10	2.19	2.44	2.65	

Source: U.S. Department of Agriculture, Agricultural Statistics, 1978, 1977. 1975 (1978: p. 434, 1977: p. 439, 1975: p. 433).

(TABLE 7-2)

Governmental Employment and Payrolls

Years	Total Employees (in thousands)	Total Monthly Payroll (in million dollars)	Monthly Income (in dollars)
1967	11,867	6,056	510.32
1968	12,342	6,889	558.18
1969	12,685	7,587	598.11
1970	13,028	8,334	639.70
1971	13,316	8,911	669.19
1972	13,759	9,950	723.16
1973	14,139	11,027	779.90
1974	14,668	12,127	826.77
1975	14,973	13,223	883.12
1976	15,012	13,924	927.52
1977	15,406	15,197	986.43
1978*	15,631	16,483	1,054.51

Source: U.S. Department of Labor, Bureau of Labor Statistics, Handbook of Labor Statistics, 1978, p. 151. (for data in 1967-77).
U.S. Department of Commerce, Bureau of The Census, Public Employment in 1978, p. 7. (for data in 1978).

* October 1978

TABLE 8

Capital Price Indexes by Industry, 1967-1978

Ind. Code	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
1	84.6	89.0	92.4	95.9	98.1	100.0	121.5	147.0	151.9	170.4	168.5	182.0
2	103.9	106.4	116.1	97.6	96.9	100.0	195.4	160.2	199.0	165.1	172.3	198.0
3	69.6	71.4	81.5	80.1	80.3	100.0	141.2	119.0	131.8	116.1	113.5	150.2
4	83.3	75.5	75.0	75.5	112.1	100.0	208.7	114.4	191.6	254.7	184.0	214.5
5	101.8	87.6	88.4	97.1	98.8	100.0	192.8	280.4	235.3	210.5	161.2	178.3
6	77.1	84.5	87.6	86.8	96.0	100.0	115.2	123.0	137.9	150.0	152.4	148.4
7												
	79.4	84.3	86.5	87.3	94.1	100.0	135.7	155.7	146.0	139.1	149.8	169.4
	81.7	86.3	87.2	86.7	94.2	100.0	145.3	167.7	150.5	137.4	147.9	168.7
	87.7	91.3	89.0	85.3	94.2	100.0	171.8	201.2	162.3	133.4	143.4	167.0
8	100.7	96.8	101.1	101.4	96.3	100.0	154.0	196.7	200.4	164.3	163.9	178.9
9	195.2	148.3	131.3	113.8	100.0	100.0	126.6	187.4	116.4	129.2	117.2	89.1
10	65.1	80.6	94.6	63.4	77.9	100.0	152.3	144.3	112.0	142.8	183.9	235.0
11	179.7	155.5	139.4	125.5	116.4	100.0	91.6	117.7	138.0	133.2	118.6	112.7
12	147.1	130.2	122.7	120.8	107.7	100.0	111.5	204.1	237.4	228.5	208.8	192.6
13	89.2	89.6	97.1	99.3	121.4	100.0	96.6	84.6	149.7	215.4	250.9	265.0
14	136.9	127.3	117.3	113.8	108.8	100.0	104.5	184.3	263.7	251.3	240.7	228.6
15	104.3	100.2	98.9	101.8	102.8	100.0	116.8	147.6	164.3	165.3	167.9	183.2
16	137.3	133.8	126.5	126.6	112.3	100.0	96.8	158.7	183.6	194.0	181.2	177.1
17	74.9	58.3	60.1	46.8	46.7	100.0	150.8	106.7	80.4	133.8	153.4	220.3
18	97.0	95.8	95.2	95.3	105.3	100.0	95.8	135.6	171.4	179.3	187.9	215.2
19	129.4	116.0	118.7	144.5	119.5	100.0	106.0	244.7	224.7	218.6	210.3	217.7
20	107.7	96.9	96.0	101.0	105.3	100.0	97.9	196.6	279.5	247.4	258.3	289.9

TABLE 8 (Continued)

Ind. Code	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
21	125.9	120.0	113.4	116.2	113.5	100.0	93.5	127.8	178.5	180.7	184.8	193.3
22	181.7	157.9	138.1	128.0	113.7	100.0	89.6	113.6	138.0	129.5	118.9	117.7
23	144.6	134.4	107.8	110.3	105.8	100.0	86.7	97.6	117.3	119.4	118.4	119.4
24	131.9	120.2	113.7	111.5	108.6	100.0	102.8	127.1	151.3	150.2	155.6	193.3
25	24.6	26.1	27.4	60.8	100.8	100.0	125.2	406.7	447.6	310.7	319.7	336.9
26	90.1	90.7	93.6	93.5	100.5	100.0	111.5	189.9	230.8	258.6	314.5	355.5
27	93.1	95.1	94.8	100.1	103.8	100.0	99.3	111.0	130.8	135.3	141.6	155.6
28	153.1	138.8	118.0	104.8	108.9	100.0	90.2	171.9	247.5	276.3	331.6	422.8
29												
	72.4	78.1	87.9	120.7	111.9	100.0	82.7	74.2	79.7	95.3	92.8	77.4
	72.4	78.1	87.9	120.7	111.9	100.0	82.7	74.2	79.7	95.3	92.8	77.4
	72.4	78.1	87.9	120.7	111.9	100.0	82.7	74.2	79.7	95.3	92.8	77.4
	72.4	78.1	87.9	120.7	111.9	100.0	82.7	74.2	79.7	95.3	92.8	77.4
30	94.5	93.0	94.9	100.9	101.4	100.0	106.7	125.6	140.5	148.1	153.1	171.5
31	100.0	102.4	101.5	103.8	105.8	100.0	97.0	93.6	107.9	115.7	121.1	146.9
32	98.5	105.8	106.9	112.5	114.1	100.0	94.5	96.3	98.4	94.7	94.6	95.2
33	89.8	88.4	88.0	90.6	96.6	100.0	104.1	125.0	150.1	168.8	195.5	221.1
34	115.8	115.7	106.4	108.3	102.8	100.0	95.7	94.5	102.1	97.0	91.5	126.2
35	104.3	100.2	98.9	101.8	102.8	100.0	116.8	147.6	164.3	165.3	167.9	183.2

TECHNICAL FOOTNOTE

Capital price indexes (r) are calculated by the following formula:

$$\ln\left(\frac{P}{P_{-1}}\right) = S_L * \ln\left(\frac{W}{W_{-1}}\right) + S_K * \ln\left(\frac{r}{r_{-1}}\right)$$

where P: price index of current year
P_{-1} : price index of previous year
W: wage rate index of current year
W_{-1} : wage rate index of previous year
r: capital price index of current yea
r_{-1} : capital price index of previous yea.
S_L : share of labor
S_K : share of capital

* The index values for industries 17 and 40 are estimated as simple averages of the other 38 industries' index values.

TABLE 9

Industrial Outputs, 1970-1978
(Water region in Oklahoma and Arkansas)
(Unit: millions of dollars)

35 Ind. Code	Industry	1970	1971	1972	1973	1974	1975	1976	1977	1978
1	Dairy farm products	38.73	40.33	40.15	53.55	61.27	55.14	53.53	53.48	67.18
2	Poultry and eggs	83.98	88.84	98.31	179.49	177.48	187.81	156.87	174.67	211.63
3	Meat animals & products	117.49	121.70	161.60	254.90	165.22	173.68	162.07	168.57	267.37
4	Cotton	27.20	37.94	43.48	51.96	34.27	67.94	48.99	61.93	41.64
5	Food and feed grains	115.95	113.44	135.75	336.65	431.59	375.42	311.14	365.69	366.45
6	Oil bearing crops	61.10	52.65	59.36	122.41	192.57	110.25	116.93	109.60	108.89
7	Misc. agricultural products									
	Fruits and nuts	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Vegetables and melons	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Misc. agricultural products, forestry & fishery	36.72	37.02	41.10	58.86	64.69	55.11	56.52	58.17	101.72
8	Food and kindred products	1,082.29	1,175.33	1,268.37	1,639.55	1,952.92	2,038.28	2,187.00	2,128.63	2,418.61
9	Apparel & Textile products	155.03	169.16	183.30	216.16	234.92	225.60	278.16	297.50	286.88
10	Lumber & wood products	124.92	135.81	146.70	161.40	175.20	167.23	197.15	213.58	256.47
11	Furniture and fixture	162.61	175.31	188.01	222.64	212.72	179.43	234.47	269.28	292.01
12	Paper and allied products	327.81	366.04	404.28	456.55	587.26	594.19	711.89	785.32	930.59
13	Printing and Publishing	160.32	173.01	185.69	214.52	244.09	254.84	277.05	319.73	345.87
14	Chemical & allied products	34.56	36.97	39.37	44.89	65.45	79.39	91.68	89.30	108.70
15	Petroleum & allied products	654.90	705.70	756.49	862.80	1,496.25	1,947.51	2,244.21	3,100.29	3,574.27
16	Rubber	171.44	199.26	227.07	277.16	334.07	370.05	450.92	530.69	547.21
17	Leather	25.92	27.36	28.80	29.70	32.18	33.59	38.07	40.89	42.59
18	Stone, clay & glass products	179.28	198.60	217.93	231.69	222.36	254.12	320.37	290.49	398.46

TABLE 9 (Continued)

35 Ind. Code	Industry	1970	1971	1972	1973	1974	1975	1976	1977	1978
19	Primary metal products	231.01	250.38	269.75	329.13	436.19	284.36	365.78	443.05	619.46
20	Fabricated metal	434.95	477.16	519.38	612.21	744.74	819.61	914.98	1,216.67	1,319.92
21	Machinery except electrical	488.14	548.92	609.70	728.07	830.08	955.98	1,009.78	1,175.94	1,665.69
22	Electrical equipments	514.32	593.75	673.18	811.74	914.16	838.83	1,020.70	1,327.00	1,452.25
23	Motor vehicle & Transp. equipment	567.48	611.79	656.10	808.89	925.66	823.66	1,007.53	1,152.53	1,326.34
24	Misc. manufacturing	193.86	211.57	229.29	277.07	313.01	314.78	291.77	430.77	465.32
25	Bituminous coal	23.42	23.42	23.42	22.56	34.59	63.76	77.16	104.84	163.20
26	Crude petroleum & nat. gas	124.56	125.86	135.75	148.73	244.11	262.21	325.13	403.21	444.82
27	Other mining except petroleum and coal	20.74	23.09	23.85	27.56	22.23	34.37	40.20	43.42	40.63
28	Contract construction	934.65	1,048.42	1,180.80	1,589.77	1,739.44	1,851.78	1,987.00	2,376.18	3,407.33
29	Transportation									
	Railroads & related service	29.69	31.01	33.65	36.98	41.14	44.01	46.65	49.16	58.72
	Motor freight transportation	174.47	198.69	227.22	267.74	291.61	298.66	329.61	378.01	565.83
	Water transportation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Other transportation	93.67	105.74	118.93	127.01	137.62	145.67	175.22	192.93	271.54
30	Wholesale & retail trade	1,230.43	1,345.86	1,506.45	1,751.46	1,926.75	2,271.09	2,444.08	2,745.83	3,755.73
31	Finance, Insurance, & real estate	1,346.62	1,497.33	1,728.74	1,829.35	1,985.72	2,190.88	2,465.37	2,806.57	4,505.37
32	Communication, radio & TV broadcasting	233.46	252.72	282.07	333.00	379.19	434.16	509.67	572.97	622.76
33	Electric, gas & sanitary services	389.87	423.25	472.11	540.25	570.20	732.64	817.59	893.17	912.02
34	Hotel & other services	1,435.15	1,566.82	1,740.63	2,009.96	2,196.85	2,520.55	2,759.05	3,153.05	5,100.99
35	Government	826.07	879.04	939.41	1,011.66	1,120.87	1,262.21	1,401.22	1,522.39	1,643.96

TABLE 10

Industrial Outputs, 1970-1978
(Non-Water Region in Oklahoma and Arkansas)
(Unit: millions of dollars)

35 Ind. Code	Industry	1970	1971	1972	1973	1974	1975	1976	1977	1978
1	Dairy farm products	198.37	205.30	203.19	274.43	303.45	267.73	268.50	256.00	333.12
2	Poultry and eggs	323.94	341.24	376.36	690.23	679.28	717.60	601.98	665.71	814.22
3	Meat animals & products	615.77	643.45	861.65	1,375.00	892.26	894.01	861.90	833.53	1,383.99
4	Cotton	132.62	168.01	211.23	305.77	194.40	326.98	241.76	303.42	242.71
5	Food and feed grains	629.46	549.44	608.43	1,700.16	1,928.64	1.751.73	1.328.46	1.495.14	1,616.12
6	Oil bearing crops	251.81	217.80	245.99	505.44	790.81	455.60	482.72	453.32	451.32
7	Misc. agricultural products									
	Fruits and nuts	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Vegetables and melons	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Misc. agricultural products, forestry & fisherv	185.06	188.04	202.65	285.74	311.14	273.01	279.82	277.50	546.49
8	Food and kindred products	1,212.35	1,307.56	1,402.77	1,804.17	2,122.85	2,226.73	2,344.01	2,328.98	2,568.69
9	Apparel & Textile products	366.84	403.14	439.44	523.03	577.38	556.30	694.66	731.99	689.45
10	Lumber & wood products	465.32	510.92	556.52	597.53	625.50	597.60	698.27	784.78	1,031.02
11	Furniture and fixture	88.97	95.97	102.97	123.87	116.87	100.37	130.13	149.12	162.61
12	Paper and allied products	212.78	241.30	269.82	321.13	408.13	407.20	492.55	510.05	611.92
13	Printing and Publishing	141.56	153.07	164.58	192.22	211.81	231.57	247.67	278.90	296.32
14	Chemical & allied products	248.99	260.80	272.62	305.90	472.54	588.13	682.46	607.46	714.88
15	Petroleum & allied products	303.75	324.81	345.88	394.28	550.05	946.30	1,045.59	1,131.50	1,308.44
16	Rubber	193.66	227.21	260.77	323.51	396.70	441.86	516.27	643.90	640.16
17	Leather	107.93	113.64	119.34	121.97	130.66	135.53	153.56	162.49	175.15
18	Stone, clay & glass products	168.17	186.21	204.25	217.60	201.66	242.60	315.18	251.97	384.42

TABLE 10 (Continued)

35 Ind. Code	Industry	1970	1971	1972	1973	1974	1975	1976	1977	1978
19	Primary metal products	207.56	231.00	254.44	322.54	374.82	259.56	365.26	514.78	623.86
20	Fabricated metal	175.38	190.44	205.50	238.06	298.56	325.27	358.47	479.79	514.99
21	Machinery except electrical	373.72	419.72	465.73	554.12	623.83	727.11	764.26	858.20	1,244.73
22	Electrical equipments	232.53	265.91	299.29	351.11	375.38	387.51	515.62	590.91	581.15
23	Motor vehicle & Transp. equipment	167.42	197.46	227.51	270.45	321.12	308.60	381.72	490.65	465.42
24	Misc. manufacturing	104.15	115.60	127.05	154.13	170.35	166.95	145.80	226.22	242.46
25	Bituminous coal	4.96	4.96	4.96	4.35	6.42	12.44	15.07	22.55	31.39
26	Crude petroleum & nat. gas	997.91	1,008.96	1,089.94	1,191.23	1,961.22	2,095.15	2,595.07	3,236.56	3,594.25
27	Other mining except petroleum and coal	119.67	134.01	139.25	160.03	150.75	205.05	241.29	257.38	235.48
28	Contract construction	1,127.44	1,271.47	1,373.90	1,858.66	2,021.89	2,133.27	2,237.54	2,664.72	3,935.62
29	Transportation									
	Railroads & related service	34.69	36.23	39.31	43.20	48.06	51.42	54.50	57.44	68.61
	Motor freight transportation	315.00	356.11	403.82	469.48	512.13	526.26	578.43	667.97	990.42
	Water transportation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Other transportation	277.53	297.96	323.22	333.30	360.59	391.38	459.26	531.11	707.35
30	Wholesale & retail trade	1,668.41	1,821.07	2,032.07	2,351.50	2,586.68	3,080.48	3,263.79	3,675.80	5,066.31
31	Finance, Insurance, & real estate	1,702.65	1,875.54	2,133.50	2,289.33	2,490.60	2,759.44	3,059.21	3,467.40	5,629.52
32	Communication, radio & TV broadcasting	219.25	239.91	267.15	312.02	356.58	403.24	471.02	523.99	452.37
33	Electric, gas & sanitary services	449.88	490.46	546.58	622.98	657.51	839.09	938.60	1,026.90	926.25
34	Hotel & other services	1,836.80	2,002.44	2,217.65	2,562.27	2,779.55	3,203.29	3,470.19	3,964.92	6,565.44
35	Government	1,760.17	1,863.69	1,986.46	2,131.32	2,350.30	2,631.31	2,922.42	3,174.46	3,422.50

TABLE 11

Industrial Outputs, 1970-1978
(Rest of the U.S.A.)
(Unit: millions of dollars)

35 Ind. Code	Industry	1970	1971	1972	1973	1974	1975	1976	1977	1978
1	Dairy farm products	6,608.69	6,899.82	7,264.75	9,185.50	9,726.72	10,941.63	11,094.20	12,072.41	12,949.07
2	Poultry and eggs	3,938.38	3,618.50	3,785.03	7,020.71	5,465.71	6,481.17	5,990.44	6,360.79	7,311.26
3	Meat animals & products	23,676.87	24,975.10	30,547.85	43,473.27	32,735.40	35,756.90	34,442.62	35,608.05	47,921.18
4	Cotton	1,259.29	1,479.11	1,838.39	3,209.22	3,077.40	2,423.87	3,472.26	4,083.67	3,595.49
5	Food and feed grains	15,202.68	16,052.03	17,064.53	35,899.13	40,874.06	38,568.30	34,160.95	32,353.91	33,068.84
6	Oil bearing crops	3,215.40	3,455.10	4,493.15	8,635.59	10,018.77	7,926.14	8,920.95	9,595.11	11,194.70
7	Misc. agricultural products									
	Fruits and nuts	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Vegetables and melons	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Misc. agricultural products, forestry & fishery	14,195.81	14,731.08	15,671.85	21,766.07	22,894.06	25,478.24	25,889.56	28,722.47	41,428.74
8	Food and kindred products	112,729.97	118,801.06	124,872.16	130,388.48	141,420.05	153,083.57	168,831.42	184,658.60	201,253.94
9	Apparel & Textile products	53,424.37	55,786.51	58,148.66	63,617.17	64,625.03	63,425.64	73,198.35	78,162.68	80,957.41
10	Lumber & wood products	18,881.13	20,077.51	21,273.88	24,878.96	25,891.36	27,125.54	32,904.09	38,660.90	44,408.58
11	Furniture and fixture	9,504.65	10,111.39	10,718.12	12,187.94	12,470.15	10,971.51	12,625.44	14,229.64	16,237.80
12	Paper and allied products	24,230.52	25,692.06	27,153.60	30,240.85	32,677.05	33,177.28	38,654.07	43,222.81	47,516.46
13	Printing and Publishing	26,171.19	27,791.46	29,411.73	31,440.14	33,492.01	35,018.43	38,621.92	42,012.02	46,709.25
14	Chemical & allied products	47,959.95	51,105.18	54,250.41	57,142.86	65,548.00	68,889.68	77,002.57	86,075.11	94,832.04
15	Petroleum & allied products	27,362.57	28,850.40	30,338.23	32,046.17	37,529.35	40,665.22	46,036.71	51,647.64	57,717.98
16	Rubber	17,513.18	18,839.92	20,166.66	23,219.72	24,627.54	24,075.32	27,993.45	33,885.75	38,396.67
17	Leather	5,422.66	5,433.01	5,443.36	5,594.34	5,594.83	5,372.82	6,224.89	6,367.65	6,695.53
18	Stone, clay & glass products	17,723.71	19,075.57	20,427.42	22,881.11	24,287.28	24,202.50	27,115.57	30,783.30	35,160.02

TABLE 11 (Continued)

35 Ind. Code	Industry	1970	1971	1972	1973	1974	1975	1976	1977	1978
19	Primary metal products	54,930.85	57,538.38	60,145.91	70,315.45	81,471.53	74,937.66	84,079.90	95,929.38	108,324.95
20	Fabricated metal	40,457.00	42,699.96	44,942.91	52,012.65	56,143.01	61,063.83	68,678.30	76,996.50	86,833.61
21	Machinery except electrical	56,874.18	59,845.42	62,816.67	72,677.18	82,881.47	85,355.94	93,857.80	105,883.87	121,740.20
22	Electrical equipments	48,146.17	50,238.55	52,330.93	60,223.20	64,283.78	61,052.17	68,384.22	78,263.11	90,672.93
23	Motor vehicle & Transp. equipment	77,042.42	85,600.51	94,158.59	96,067.04	92,789.88	90,229.16	115,675.54	143,285.00	160,925.81
24	Misc. manufacturing	29,150.71	30,711.78	32,272.86	35,736.99	39,173.96	42,779.76	48,272.34	55,058.04	61,605.93
25	Bituminous coal	4,265.83	4,512.09	5,414.02	6,233.66	8,790.59	11,313.49	13,034.78	13,926.53	17,856.45
26	Crude petroleum & nat. gas	14,672.35	15,150.70	16,593.30	18,060.69	29,860.45	33,286.66	37,246.22	47,171.14	60,023.46
27	Other mining except petroleum and coal	6,318.41	6,486.35	6,961.11	8,135.93	9,226.01	10,238.30	11,147.86	11,689.10	14,508.79
28	Contract construction	137,641.04	150,152.62	163,442.89	185,579.78	194,519.36	190,920.84	208,102.57	238,136.08	337,112.53
29	Transportation									
	Railroads & related service	13,520.18	14,085.15	15,039.54	16,678.36	17,614.89	17,494.29	19,175.45	21,159.14	24,139.80
	Motor freight transportation	23,017.25	25,801.76	29,361.36	34,016.48	36,401.39	35,537.60	40,121.42	46,668.18	61,960.28
	Water transportation	5,877.77	5,981.52	7,307.50	8,082.34	8,873.39	9,249.47	10,173.44	10,958.01	12,828.65
	Other transportation	17,624.77	17,904.11	21,924.55	23,752.26	26,010.37	27,895.37	30,710.08	35,821.15	40,399.76
30	Wholesale & retail trade	182,990.63	195,668.97	212,845.47	238,548.94	261,431.61	280,092.69	311,528.33	336,046.17	446,438.26
31	Finance, Insurance, & real estate	206,488.50	226,141.17	248,604.76	265,335.86	280,364.45	300,837.82	340,259.07	406,764.70	580,277.74
32	Communication, radio & TV broadcasting	25,493.86	27,632.89	35,529.18	41,207.32	45,008.68	50,801.45	56,913.92	63,998.35	73,750.47
33	Electric, gas & sanitary services	35,224.85	38,180.46	49,128.90	57,008.21	61,397.00	66,252.24	73,835.37	82,657.74	93,160.85
34	Hotel & other services	221,596.73	238,906.86	265,789.81	298,429.36	327,796.07	363,345.25	401,756.74	455,390.15	705,225.24
35	Government	126,848.95	137,415.33	153,604.73	166,810.87	181,243.20	199,312.61	213,827.34	230,323.30	249,075.92

Footnotes for TABLES 9, 10 and 11

Sources: U.S. Department of Agriculture, National Economic Division, Economics, Statistics, and Cooperative Service, 1) Farm Income State Estimates 1957-1972, FIS 222 Supplement/August 1973, pp. 60-61 and pp. 87-90. 2) State Farm Income Statistics, Supplement to Statistical Bulletin, No. 627, Jan. 1980, pp. 50-51, 54, 79.

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1973, pp. 176, 178-180
1974, pp. 192-193
1975, pp. 187, 189
1976, pp. 182, 184-186

Other: Center for Economic and Management Research, College of Business Administration, University of Oklahoma.

TABLE 12

Ratios of final demand of Oklahoma to U.S. (1970)

IND. CODE	INDUSTRY	PERSONAL CONSUMPTION EXPENDITURE	GROSS PRIVATE CAPITAL FORMATION	NET INVENTORY CHANGE	NET FOREIGN EXPORT	STATE, LOCAL GOVERNMENT PURCHASE	FEDERAL GOVERNMENT PURCHASE
1	Dairy farm products	0.012855	0.0	0.013970	0.0	.0.013000	0.028014
2	Poultry and eggs	0.012855	0.0	0.013970	0.0	0.013000	0.028014
3	Meat animals and products	0.012855	0.0	0.013970	0.0	0.013000	0.028014
4	Cotton	0.012121	0.0	0.000207	0.0	0.011048	0.018940
5	Food & food grains	0.012121	0.0	0.000207	0.0	0.011048	0.018940
6	Oil bearing crops	0.012121	0.0	0.000207	0.0	0.011048	0.018940
7	Misc. agricultural products						
	Fruits and nuts	0.012121	0.0	0.000207	0.0	0.011048	0.018940
	Vegetables and melons	0.012121	0.0	0.000207	0.0	0.011048	0.018940
	Misc. agricultural products	0.011219	0.0	0.006200	0.002123	0.007929	0.001699
8	Food and kindred products	0.011409	0.0	0.000103	0.0	0.012382	0.008624
9	Apparel & textile products	0.011695	0.008526	0.002734	0.0	0.012956	0.002976
10	Lumber & wood products	0.017464	0.003500	0.000441	0.0	0.013750	0.000227
11	Furniture & fixtures	0.012685	0.008469	0.002604	0.0	0.012323	0.006358
12	Paper & allied products	0.012904	0.0	0.002200	0.0	0.014079	0.005480
13	Printing & publishing	0.010886	0.0	0.004836	0.0	0.013166	0.008000
14	Chemical & allied products	0.013337	0.0	0.001179	0.0	0.011267	0.000709
15	Petroleum & allied products	0.013218	0.0	0.034806	0.0	0.014396	0.034021
16	Rubber	0.012795	0.013915	0.009970	0.0	0.014764	0.029053
17	Leather	0.011829	0.0	0.002933	0.0	0.014500	0.001340
18	Stone, clay & glass products	0.011650	0.0	0.013437	0.0	0.012604	0.021136
19	Primary metal products	0.011792	0.0	0.001434	0.0	0.012333	0.011947
20	Fabricated metal	0.012424	0.013855	0.010171	0.0	0.012129	0.014146
21	Machinery except electric	0.011954	0.011325	0.010781	0.0	0.011328	0.005618
22	Electrical equipment	0.012839	0.009419	0.009092	0.0	0.012485	0.013350
23	Motor vehicle & transp. equip.	0.012171	0.009480	0.013010	0.0	0.012560	0.004153
24	Misc. manufacturing	0.011404	0.008669	0.002026	0.0	0.011792	0.000514
25	Bituminous coal	0.010576	0.0	0.000667	0.0	0.013484	0.001718
26	Crude petroleum & nat. gas	0.0	0.0	0.061619	0.0	0.0	0.0
27	Other mining	0.011963	0.0	0.004374	0.0	0.012667	0.024229
28	Contract construction	0.0	0.012902	0.0	0.0	0.011492	0.018336

TABLE 12
(cont'd)

Ratios of final demand of Oklahoma to U.S. (1970)

IND. CODE	INDUSTRY	PERSONAL CONSUMPTION EXPENDITURE	GROSS PRIVATE CAPITAL FORMATION	NET INVENTORY CHANCE	NET FOREIGN EXPORT	STATE, LOCAL GOVERNMENT PURCHASE	FEDERAL GOVERNMENT PURCHASE
29	Transportation						
	Railroad & related services	0.010669	0.010298	0.002000	0.003857	0.012710	0.012063
	Motor freight transportation	0.010669	0.010298	0.002000	0.003857	0.012710	0.012063
	Water transportation	0.010669	0.010298	0.002000	0.003857	0.012710	0.012063
	Other transportation	0.010669	0.010298	0.002000	0.003857	0.012710	0.012063
30	Wholesale & retail trade	0.011888	0.009860	0.007160	0.009946	0.013621	0.009589
31	F nance, insurance & real estate	0.010547	0.014680	0.0	0.005618	0.014141	0.011488
32	mmunication, radio & TV broadcasting	0.011431	0.014825	0.0	0.009993	0.013605	0.019250
33	ctric, gas & sanitary services	0.012869	0.0	0.0	0.0	0.013206	0.017308
34	H el & other services	0.011524	0.0	0.0	0.004580	0.012721	0.012358
35	Government	0.011813	0.0	0.0	0.007235	0.012568	0.019655

Source: Raymond C. Scheppach, Jr., "State Projections of the Gross National Products, 1970, 1980." Lexington Books, D.C. Heath and Company, 1972: pp. 100-247.

TABLE 13

Ratios of final demand of Arkansas to U.S. (1970)

IND. CODE	INDUSTRY	PERSONAL CONSUMPTION EXPENDITURE	GROSS PRIVATE CAPITAL FORMATION	NET INVENTORY CHANGE	NET FOREIGN EXPORT	STATE, LOCAL GOVERNMENT PURCHASE	FEDERAL GOVERNMENT PURCHASE
1	Dairy farm products	0.009054	0.0	0.019000	0.0.	0.006037	0.014986
2	Poultry and eggs	0.009054	0.0	0.019000	0.0	0.006037	0.014986
3	Meat animals & products	0.009054	0.0	0.019000	0.0	0.006037	0.014986
4	Cotton	0.008443	0.0	0.033850	0.0	0.006750	0.061330
5	Food & feed grains	0.008443	0.0	0.033850	0.0	0.006750	0.061330
6	Oil bearing crops	0.008443	0.0	0.033850	0.0	0.006750	0.061330
7	Misc. agricultural products						
	Fruits and nuts	0.008443	0.0	0.033850	0.0	0.006750	0.061330
	Vegetables and melons	0.008443	0.0	0.033850	0.0	0.006750	0.061330
	Misc. agricultural products	0.007823	0.0	0.056567	0.002712	0.006929	0.013228
8	Food and kindred products	0.007955	0.0	0.016600	0.0	0.006763	0.013437
9	Apparel & textile products	0.007879	0.004794	0.007496	0.0	0.006368	0.005909
10	Lumber & wood products	0.016291	0.014000	0.021695	0.0	0.006250	0.002864
11	Furniture & fixtures	0.008720	0.005044	0.026833	0.0	0.006671	0.016505
12	Paper & allied products	0.008990	0.0	0.024481	0.0	0.007642	0.010592
13	Printing & publishing	0.007352	0.0	0.004311	0.0	0.006666	0.006143
14	Chemical & allied products	0.009318	0.0	0.002241	0.0	0.006988	0.002585
15	Petroleum & allied products	0.007668	0.0	0.006633	0.0	0.006375	0.005834
16	Rubber	0.008646	0.009489	0.007922	0.0	0.005939	0.026201
17	Leather	0.008102	0.0	0.053000	0.0	0.006000	0.025880
18	Stone, clay & glass products	0.007894	0.0	0.006146	0.0	0.005921	0.004318
19	Primary metal products	0.008354	0.0	0.003193	0.0	0.007167	0.026421
20	Fabricated metal	0.008520	0.006472	0.005089	0.0	0.007553	0.004041
21	Machinery except electric	0.007632	0.008994	0.001391	0.0	0.007378	0.004977
22	Electrical equipment	0.008819	0.006402	0.007677	0.0	0.007205	0.006437
23	Motor vehicle & transp. equip.	0.008043	0.007992	0.003638	0.0	0.006810	0.000861
24	Misc. manufacturing	0.007685	0.005421	0.011364	0.0	0.006978	0.001642
25	Bituminous coal	0.008159	0.0	0.000417	0.0	0.006419	0.000667
26	Crude petroleum & natural gas	0.0	0.0	0.001975	0.0	0.0	0.0
27	Other mining	0.008407	0.0	0.017897	0.0	0.010333	0.517914
28	Contract construction	0.0	0.007258	0.0	0.0	0.008149	0.012231

TABLE 13
(cont'd)

Ratios of final demand of Arkansas to U.S. (1970)

IND. CODE	INDUSTRY	PERSONAL CONSUMPTION EXPENDITURE	GROSS PRIVATE CAPITAL FORMATION	NET INVENTORY CHANGE	NET FOREIGN EXPORT	STATE, LOCAL GOVERNMENT PURCHASE	FEDERAL GOVERNMENT PURCHASE
29	Transportation						
	Railroad & related services	0.007365	0.007724	0.006189	0.004582	0.006915	0.006586
	Motor freight transportation	0.007365	0.007724	0.006189	0.004582	0.006915	0.006586
	Water transportation	0.007365	0.007724	0.006189	0.004582	0.006915	0.006586
	Other transportation	0.007365	0.007724	0.006189	0.004582	0.006915	0.006586
30	Wholesale & retail trade	0.008057	0.007688	0.003680	0.004438	0.006274	0.010817
31	Finance, insurance & real estate	0.007250	0.007203	0.0	0.005791	0.006175	0.007817
32	Communication, radio & TV broadcasting	0.007910	0.008468	0.0	0.008118	0.006350	0.006065
33	Electric, gas & sanitary services	0.009073	0.0	0.0	0.0	0.007076	0.006460
34	Hotel & other services	0.007375	0.0	0.0	0.002173	0.006290	0.004895
35	Government	0.008081	0.0	0.0	0.004221	0.006988	0.005001

Source: Raymond C. Scheppach, Jr., "State Projection of the Gross National Products, 1970, 1980." Lexington Books, D.C. Heath and Company, 1972: pp. 100-247.

TABLE 14 WAGE INDEX

	1972	1973	1974	1975	1976	1977	1978
1	100.00	104.70	122.30	132.10	144.60	156.00	171.70
2	100.00	104.70	122.30	132.10	144.60	156.00	171.70
3	100.00	104.70	122.30	132.10	144.60	156.00	171.70
4	100.00	104.70	122.30	132.10	144.60	156.00	171.70
5	100.00	104.70	122.30	132.10	144.60	156.00	171.70
6	100.00	104.70	122.30	132.10	144.60	156.00	171.70
7	100.00	104.70	122.30	132.10	144.60	156.00	171.70
8	100.00	104.70	122.30	132.10	144.60	156.00	171.70
9	100.00	104.70	122.30	132.10	144.60	156.00	171.70
10	100.00	106.40	115.30	126.90	137.80	146.30	161.10
11	100.00	105.50	114.60	122.20	130.70	138.70	151.00
12	100.00	105.20	118.10	129.30	142.30	152.90	169.50
13	100.00	106.50	114.10	124.90	132.10	140.50	152.90
14	100.00	106.30	114.20	126.60	137.30	150.30	165.50
15	100.00	104.50	110.70	119.60	127.00	135.90	144.40
16	100.00	106.40	115.60	127.90	140.20	152.10	166.90
17	100.00	105.50	113.70	129.70	144.50	156.00	173.70
18	100.00	103.50	111.00	120.60	128.30	142.20	152.80
19	100.00	103.70	111.10	119.20	126.90	134.30	143.90
20	100.00	106.90	115.60	125.10	135.30	147.30	161.60
21	100.00	107.90	120.20	132.40	145.90	159.90	176.00
22	100.00	104.30	115.30	125.30	135.10	146.40	158.90
23	100.00	106.60	115.20	125.50	134.90	145.20	158.30
24	100.00	105.30	113.10	124.90	133.80	145.50	156.90
25	100.00	107.20	115.80	127.30	138.30	151.80	167.20
26	100.00	105.10	112.50	121.90	128.90	139.50	150.50
27	100.00	107.50	116.90	125.40	148.10	158.40	179.20
28	100.00	106.20	119.50	125.70	147.80	159.90	180.50
29	100.00	107.20	114.40	124.70	136.20	147.60	159.70
30	100.00	100.80	111.60	110.60	126.70	132.70	142.70
31	100.00	102.10	117.20	125.50	133.40	145.60	160.80
32	100.00	102.10	117.20	125.50	133.40	143.60	160.80
33	100.00	102.10	117.20	125.50	133.40	143.60	160.80
34	100.00	102.10	117.20	125.50	133.40	143.60	160.80
35	100.00	106.30	114.90	124.20	131.70	141.70	154.30
36	100.00	104.60	110.40	119.70	126.40	133.30	142.00
37	100.00	108.70	113.20	133.80	148.80	160.60	172.10
38	100.00	105.40	114.00	124.30	135.20	146.00	158.20
39	100.00	105.90	115.90	124.30	134.10	144.70	160.20
40	100.00	107.70	114.30	122.10	128.30	136.40	145.80

Remark: See Table 23 (p. 241) for the 40 sector industrial classification.

TABLE 15

HOURLY WAGE

	1972	1973	1974	1975	1976	1977	1978
1	1.84	2.00	2.25	2.43	2.66	2.87	3.16
2	1.84	2.00	2.25	2.43	2.66	2.87	3.16
3	1.84	2.00	2.25	2.43	2.66	2.87	3.16
4	1.84	2.00	2.25	2.43	2.66	2.87	3.16
5	1.84	2.00	2.25	2.43	2.66	2.87	3.16
6	1.84	2.00	2.25	2.43	2.66	2.87	3.16
7	1.84	2.00	2.25	2.43	2.66	2.87	3.16
8	1.84	2.00	2.25	2.43	2.66	2.87	3.16
9	1.84	2.00	2.25	2.43	2.66	2.87	3.16
10	3.40	3.43	4.15	4.87	4.96	5.34	5.80
11	2.61	2.78	2.99	3.19	3.41	3.62	3.94
12	4.31	4.64	4.91	5.23	4.71	5.06	5.61
13	3.06	3.26	3.49	3.75	3.98	4.39	4.68
14	5.64	4.19	4.59	4.99	5.43	5.92	6.52
15	4.48	4.68	4.96	5.26	5.69	6.09	6.47
16	4.20	4.37	4.85	5.37	5.89	6.39	7.01
17	4.95	5.22	5.51	6.42	7.14	7.72	8.60
18	3.60	3.80	4.03	4.33	4.62	5.12	5.53
19	2.71	2.81	3.01	3.15	3.44	3.64	3.90
20	3.98	4.18	4.52	4.89	5.29	5.76	6.32
21	4.84	5.03	5.66	6.17	6.60	7.45	8.20
22	3.99	4.24	4.59	5.04	5.43	5.84	6.34
23	4.27	4.53	4.92	5.36	5.76	6.20	6.76
24	3.97	4.04	4.15	4.58	4.91	5.34	5.83
25	4.73	5.37	5.47	6.02	6.54	7.18	7.91
26	3.11	3.27	3.50	3.79	4.01	4.34	4.69
27	5.74	5.76	6.24	7.23	7.91	8.46	9.57
28	4.85	4.89	5.33	6.05	6.59	7.13	8.05
29	3.95	4.24	4.52	4.91	5.38	5.84	6.31
30	6.66	6.47	6.75	7.25	7.68	8.04	8.65
31	4.82	5.26	5.55	6.05	6.43	6.92	7.75
32	4.82	5.26	5.65	6.05	6.43	6.92	7.75
33	4.82	5.26	5.55	6.05	6.43	6.92	7.75
34	4.82	5.26	5.65	6.05	6.43	6.92	7.75
35	3.32	3.20	3.47	3.75	3.97	4.28	4.66
36	3.46	3.61	3.81	4.13	4.36	4.60	4.90
37	4.26	4.63	5.06	5.70	6.24	6.84	7.33
38	4.83	5.14	5.48	5.99	6.56	7.05	7.64
39	2.26	2.39	2.62	2.81	3.03	3.27	3.62
40	3.01	3.26	3.44	3.68	3.86	4.11	4.39

Remark: See Table 23 (p. 241) for the 40 sector industrial classification.

TABLE 16

ESTIMATED EMPLOYMENT STATISTICS

FOR YEAR 1972

	OKL-HOMA			ARKANSAS			OK WATER			ARKANS WATER		
	WAGE	LINDEX	HOURS	WAGE	LINDEX	HOURS	WAGE	LINDEX	HOURS	WAGE	LINDEX	HOURS
1	4.80	4.80	2.61	3.48	3.48	1.89	0.67	0.67	0.36	0.95	0.95	0.52
2	0.54	0.54	0.29	9.09	9.09	4.94	0.08	0.08	0.04	1.93	1.93	1.05
3	34.18	34.18	18.58	9.45	9.45	5.14	4.86	4.86	2.64	2.10	2.10	1.14
4	1.29	1.29	0.70	8.58	8.58	4.66	0.04	0.04	0.02	1.65	1.65	0.90
5	20.37	20.37	11.07	19.73	19.73	10.72	0.62	0.62	0.34	5.51	5.51	2.99
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	2.89	2.89	1.57	22.09	22.09	12.00	0.49	0.49	0.27	4.36	4.36	2.37
9	13.26	13.26	7.21	15.91	15.91	8.65	1.77	1.77	0.96	3.70	3.70	2.01
10	111.99	111.99	31.11	169.81	169.81	47.17	30.58	30.58	8.50	100.35	100.35	27.88
11	63.57	63.57	24.36	120.54	120.54	46.18	14.91	14.91	5.71	40.18	40.18	15.39
12	35.17	35.17	10.63	134.66	134.66	40.68	2.57	2.57	0.78	32.96	32.96	9.96
13	13.28	13.28	4.34	79.42	79.42	25.95	6.49	6.49	2.12	53.44	53.44	17.46
14	26.17	26.17	6.65	140.67	140.67	35.70	7.33	7.33	1.86	93.78	93.78	23.80
15	73.93	73.93	16.50	66.59	66.59	14.86	28.32	28.32	6.32	46.69	46.69	10.42
16	12.78	12.78	3.04	51.20	51.20	12.19	3.51	3.51	0.84	4.78	4.78	1.14
17	57.55	57.55	11.71	19.32	19.32	3.90	43.72	43.72	8.83	4.02	4.02	0.81
18	74.44	74.44	20.68	66.62	66.62	18.51	28.92	28.92	8.03	37.23	37.23	10.34
19	4.02	4.02	1.48	54.14	54.14	19.98	1.26	1.26	0.46	10.03	10.03	3.70
20	95.42	95.42	25.17	52.12	52.12	13.33	39.45	39.45	10.09	37.48	37.48	9.59
21	62.55	62.55	13.51	76.56	76.56	16.43	58.85	58.85	12.63	23.76	23.76	5.10
22	129.00	129.00	32.33	99.65	99.65	24.98	85.82	85.82	21.51	77.58	77.58	19.44
23	292.96	292.96	58.62	82.54	82.54	19.33	159.43	159.43	37.34	53.67	53.67	12.57
24	132.27	132.27	36.94	222.39	222.39	60.60	56.69	56.69	15.45	186.16	186.16	50.73
25	98.96	98.96	20.92	61.75	61.75	13.05	57.01	57.01	12.05	59.44	59.44	12.57
26	29.49	29.49	9.48	91.17	91.17	29.32	22.72	22.72	7.31	54.74	54.74	17.60
27	9.15	9.15	1.71	1.98	1.98	0.37	7.16	7.16	1.34	1.98	1.98	0.37
28	131.91	131.91	29.58	9.60	9.60	2.15	13.91	13.91	3.12	1.69	1.69	0.38
29	9.63	9.63	2.44	22.96	22.96	5.81	1.73	1.73	0.44	2.89	2.89	0.73
30	561.36	561.36	92.63	364.42	364.42	60.13	184.09	184.09	30.38	243.81	243.81	40.23
31	49.42	49.42	10.23	81.50	81.50	16.91	22.79	22.79	4.73	32.36	32.36	6.71
32	169.55	169.55	35.07	105.55	105.55	21.90	42.35	42.35	8.79	56.52	56.52	11.73
33	0.0	0.0	0.0	0.82	0.82	0.17	0.0	0.0	0.0	0.82	0.82	0.17
34	161.35	161.35	33.47	21.52	21.52	4.46	30.36	30.36	6.30	18.83	18.83	3.91
35	927.30	927.30	397.07	576.52	576.52	190.90	319.90	319.90	105.93	320.34	320.34	106.07
36	377.13	377.13	169.33	227.65	227.65	65.99	122.08	122.08	35.38	148.65	148.65	43.09
37	133.27	133.27	31.28	78.90	78.90	18.52	48.76	48.76	11.45	60.20	60.20	14.13
38	89.11	89.11	13.45	53.31	53.31	11.04	36.16	36.16	7.49	29.84	29.84	6.18
39	1017.07	1017.07	450.03	596.04	596.04	263.73	367.84	367.84	162.76	341.51	341.51	151.11
40	1856.10	1856.10	616.65	839.44	839.44	278.88	533.86	533.86	177.36	331.60	331.60	110.17

Remark: See Table 23 (p. 241) for the 40 sector industrial classification.

TABLE 16 (continued)

ESTIMATED EMPLOYMENT STATISTICS

FOR YEAR 1972

	OK NONWATER			ARK NONWATER			REST U.S.A.			U.S.A.		
	WAGE	LINDEX	HOURS	WAGE	LINDEX	HOURS	WAGE	LINDEX	HOURS	WAGE	LINDEX	HOURS
1	4.14	4.14	2.25	2.53	2.53	1.37	607.58	607.58	330.21	615.86	615.86	334.71
2	0.46	0.46	0.25	7.16	7.16	3.89	89.84	89.84	48.82	99.47	99.47	54.05
3	29.32	29.32	15.94	7.35	7.35	3.99	1095.23	1095.23	595.23	1138.87	1138.87	618.95
4	1.26	1.26	0.68	6.93	6.93	3.77	71.23	71.23	38.71	81.10	81.10	44.08
5	19.75	19.75	10.73	14.22	14.22	7.73	1192.57	1192.57	648.13	1232.67	1232.67	669.93
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	2.39	2.39	1.30	17.73	17.73	9.63	367.42	367.42	199.68	392.39	392.39	213.25
9	11.49	11.49	6.25	12.21	12.21	6.64	5187.12	5187.12	2819.09	5216.29	5216.29	2834.94
10	81.41	81.41	22.61	69.46	69.46	19.29	17596.72	17596.72	4887.98	17878.52	17878.52	4966.25
11	48.66	48.66	18.64	80.36	80.36	30.79	15787.85	15787.85	6048.98	15971.96	15971.96	6119.52
12	32.60	32.60	9.85	101.70	101.70	30.73	4966.54	4966.54	1500.46	5136.37	5136.37	1551.77
13	6.79	6.79	2.22	25.98	25.98	8.49	3570.26	3570.26	1166.75	3662.95	3662.95	1197.04
14	18.85	18.85	4.79	46.89	46.89	11.90	7337.28	7337.28	1862.25	7504.14	7504.14	1904.60
15	45.60	45.60	10.18	19.90	19.90	4.44	11264.24	11264.24	2514.34	11404.76	11404.76	2545.71
16	9.27	9.27	2.21	46.41	46.41	11.05	12517.80	12517.80	2980.43	12581.78	12581.78	2995.66
17	14.23	14.23	2.88	15.29	15.29	3.09	3147.60	3147.60	635.88	3224.87	3224.87	651.49
18	45.52	45.52	12.65	29.39	29.39	8.16	6100.05	6100.05	1694.46	6241.12	6241.12	1733.64
19	2.77	2.77	1.02	44.11	44.11	16.28	1853.89	1853.89	684.09	1912.05	1912.05	705.55
20	58.97	58.97	15.08	14.64	14.64	3.75	6769.59	6769.59	1731.35	6920.13	6920.13	1769.86
21	4.10	4.10	0.88	52.80	52.80	11.33	15818.02	15818.02	3394.43	15957.54	15957.54	3424.37
22	43.18	43.18	10.82	22.07	22.07	5.53	14415.53	14415.53	3612.91	14644.18	14644.18	3670.22
23	133.56	133.56	31.28	28.87	28.87	6.76	22725.34	22725.34	5322.09	23100.87	23100.87	5410.04
24	75.58	75.58	20.59	36.23	36.23	9.87	19628.63	19628.63	5348.40	19983.30	19983.30	5445.04
25	41.94	41.94	8.87	2.32	2.32	0.49	24075.65	24075.65	5089.99	24236.36	24236.36	5123.97
26	6.76	6.76	2.17	36.43	36.43	11.71	11960.03	11960.03	3845.67	12080.68	12080.68	3884.46
27	1.99	1.99	0.37	0.0	0.0	0.0	2136.80	2136.80	400.15	2147.93	2147.93	402.23
28	118.00	118.00	26.46	7.91	7.91	1.77	1984.46	1984.46	444.95	2125.96	2125.96	476.67
29	7.89	7.89	2.00	20.07	20.07	5.08	1967.41	1967.41	498.08	2000.00	2000.00	506.33
30	377.27	377.27	62.26	120.61	120.61	19.90	59228.83	59228.83	9773.73	60154.60	60154.60	9926.50
31	26.63	26.63	5.52	49.14	49.14	10.19	6166.25	6166.25	1279.30	6297.17	6297.17	1306.47
32	126.70	126.70	26.29	49.03	49.03	10.17	12776.79	12776.79	2650.79	13051.39	13051.39	2707.76
33	0.0	0.0	0.0	0.0	0.0	0.0	1795.18	1795.18	372.44	1796.00	1796.00	372.61
34	130.99	130.99	27.18	2.69	2.69	0.56	9067.65	9067.65	1881.25	9250.51	9250.51	1919.19
35	607.45	607.45	201.14	256.18	256.18	84.83	90459.18	90459.18	29953.37	91963.06	91963.06	30451.34
36	255.11	255.11	73.94	79.00	79.00	22.90	38932.04	38932.04	11284.65	39536.87	39536.87	11459.96
37	84.51	84.51	19.84	18.70	18.70	4.39	13725.22	13725.22	3221.88	13937.39	13937.39	3271.65
38	52.95	52.95	10.96	23.47	23.47	4.86	6868.52	6868.52	1422.05	7010.94	7010.94	1451.54
39	649.23	649.23	287.27	254.53	254.53	112.62	108316.82	108316.82	47927.80	109929.93	109929.93	48641.56
40	1322.24	1322.24	439.28	507.84	507.84	168.72	141512.56	141512.56	47014.14	144208.10	144208.10	47909.67

Remark: See Table 23 (p. 241) for the 40 sector industrial classification.

TABLE 17

ESTIMATED EMPLOYMENT STATISTICS

FOR YEAR 1973

	OKLAHOMA			ARKANSAS			OK WATER			ARKANS WATER		
	WAGE	LINDEX	HOURS	WAGE	LINDEX	HOURS	WAGE	LINDEX	HOURS	WAGE	LINDEX	HOURS
1	6.58	6.05	3.29	4.38	4.03	2.19	0.91	0.84	0.44	1.19	1.10	0.60
2	1.13	1.04	0.56	16.45	15.13	8.22	0.17	0.15	0.09	3.49	3.21	1.75
3	55.74	51.23	27.87	13.59	12.50	6.79	7.52	7.29	3.95	3.03	2.79	1.51
4	3.97	3.65	1.98	9.89	9.10	4.93	0.11	0.10	0.06	1.90	1.75	0.95
5	65.62	60.36	32.81	47.92	44.08	23.95	2.00	1.84	1.00	13.38	12.31	6.69
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	4.80	4.41	2.40	46.54	42.82	23.27	0.82	0.76	0.41	9.19	8.45	4.59
9	18.10	16.65	9.05	23.00	21.99	11.95	2.41	2.22	1.21	5.56	5.11	2.78
10	142.82	134.23	37.29	220.29	207.04	57.52	39.00	36.66	10.18	130.19	122.36	33.99
11	79.15	74.32	29.47	138.51	130.05	49.82	18.57	17.43	6.64	46.17	43.35	16.61
12	33.71	31.15	9.41	149.67	138.33	41.81	2.46	2.28	0.69	36.63	33.86	10.23
13	17.95	16.85	5.51	92.40	86.76	28.34	8.77	8.24	2.69	62.18	58.39	19.07
14	35.94	33.81	8.50	155.86	146.62	37.20	10.06	9.47	2.49	103.90	97.75	24.49
15	87.22	83.46	18.64	75.89	72.62	16.22	33.42	31.98	7.14	53.21	50.92	11.37
16	15.15	14.24	3.39	56.88	53.45	12.72	4.16	3.91	0.93	5.31	4.99	1.19
17	66.10	62.65	12.56	21.99	20.85	4.21	49.87	47.27	9.55	4.58	4.34	0.88
18	95.63	90.56	23.17	77.72	73.60	20.45	37.15	35.18	9.78	63.43	61.13	11.42
19	4.77	4.60	1.70	54.75	52.80	19.48	1.45	1.44	0.53	10.14	9.78	3.91
20	105.00	98.23	25.12	55.22	51.69	13.21	42.09	39.37	10.07	39.71	37.14	9.50
21	74.41	69.10	14.83	97.35	90.22	19.35	69.74	64.64	13.87	30.21	28.00	6.31
22	142.74	133.29	33.66	124.91	117.50	29.46	94.96	89.33	22.60	97.24	91.48	22.93
23	349.56	324.17	75.95	102.27	95.94	22.48	189.04	176.30	41.33	66.80	62.38	14.62
24	151.80	144.30	39.33	271.81	258.33	70.42	65.06	61.84	16.85	227.53	216.28	58.95
25	117.09	109.22	23.09	78.57	73.29	15.50	67.46	62.93	13.31	75.62	70.54	14.91
26	34.93	33.24	10.68	111.09	105.70	33.97	26.93	25.62	8.23	65.70	63.46	20.40
27	2.03	1.97	1.40	2.45	2.28	0.43	6.29	5.85	1.10	2.65	2.28	0.43
28	143.68	136.53	30.64	10.96	10.42	2.34	15.15	14.41	3.23	1.93	1.83	0.41
29	11.45	10.67	2.70	25.88	24.12	6.10	2.06	1.92	0.49	3.26	3.04	0.77
30	762.12	713.60	117.79	487.53	455.49	73.35	249.93	234.01	38.53	326.19	305.41	50.41
31	54.31	49.79	10.32	91.09	83.49	17.32	25.04	22.96	4.76	36.17	33.15	6.88
32	193.99	177.61	36.88	126.81	116.24	24.11	43.60	44.55	9.24	67.91	62.25	12.91
33	0.0	0.0	0.0	0.84	0.77	0.16	0.0	0.0	0.0	0.84	0.77	0.16
34	166.05	152.20	31.57	24.33	22.30	4.62	31.24	28.64	5.94	21.29	19.51	4.05
35	1085.77	1005.45	333.05	677.98	639.60	211.87	367.65	346.84	114.89	379.72	355.39	117.72
36	408.87	390.98	113.29	236.03	225.65	65.38	132.35	126.54	36.67	154.12	147.34	42.69
37	154.84	142.44	33.44	94.34	86.79	20.38	56.16	52.12	12.24	71.98	66.22	15.55
38	100.71	94.55	19.59	61.92	58.20	12.05	40.87	38.41	7.95	34.66	32.58	6.74
39	1176.27	1111.60	492.08	687.24	649.56	287.55	425.35	402.03	177.97	393.77	372.18	164.76
40	1972.06	1827.67	606.79	923.50	855.89	284.15	567.21	525.68	174.53	364.81	338.10	112.25

Remark: See Table 23 (p. 241) for the 40 sector industrial classification.

TABLE 17 (continued)

ESTIMATED EMPLOYMENT STATISTICS

FOR YEAR 1973

	OK NONWATER			ARK NONWATER			REST U.S.A.			U.S.A.		
	WAGE	LINDEX	HOURS	WAGE	LINDEX	HOURS	WAGE	LINDEX	HOURS	WAGE	LINDEX	HOURS
1	5.67	5.21	2.83	3.19	2.93	1.59	769.39	707.81	384.70	780.35	717.90	390.18
2	0.96	0.89	0.48	12.96	11.92	6.48	166.67	153.33	83.33	184.25	169.50	92.12
3	47.82	43.99	23.91	10.56	9.72	5.28	1557.68	1433.01	778.84	1627.01	1496.79	813.50
4	3.86	3.55	1.93	7.99	7.35	4.00	124.35	114.39	62.17	138.21	127.15	69.10
5	63.62	58.53	31.81	34.54	31.77	17.27	2512.29	2311.21	1256.14	2625.82	2415.66	1312.91
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	3.98	3.66	1.99	37.36	34.37	18.68	706.15	649.63	353.08	757.49	696.87	378.75
9	15.69	14.43	7.84	18.34	16.88	9.17	7204.70	6628.06	3602.35	7246.70	6666.70	3623.35
10	103.82	97.57	27.11	90.10	84.68	23.53	18396.96	17290.38	4803.38	18760.07	17631.65	4898.19
11	60.59	56.89	21.79	92.34	86.70	33.21	17272.09	16217.92	6212.98	17489.75	16422.30	6291.28
12	31.24	28.88	8.73	113.04	104.47	31.57	5808.58	5368.37	1622.51	5991.95	5537.85	1673.73
13	9.17	8.61	2.81	30.23	28.38	9.27	4060.12	3812.32	1245.44	4170.47	3915.94	1279.29
14	25.97	24.34	6.18	51.95	48.87	12.40	8172.80	7688.43	1950.55	8364.59	7868.86	1996.32
15	53.80	51.48	11.50	22.68	21.70	4.85	12040.58	11522.08	2572.77	12203.68	11678.17	2607.62
16	10.99	10.32	2.46	51.56	48.46	11.54	13185.68	12392.56	2949.82	13257.70	12460.25	2965.93
17	16.23	15.39	3.11	17.41	16.50	3.34	3327.83	3154.34	637.52	3415.92	3237.84	654.39
18	58.48	55.38	15.39	34.29	32.47	9.02	7024.39	6651.88	1848.52	7197.74	6816.05	1894.14
19	3.28	3.16	1.17	44.61	43.02	15.98	1905.37	1837.38	678.07	1964.89	1894.78	699.25
20	62.91	58.85	15.05	15.51	14.51	3.71	7583.31	7093.83	1814.19	7743.53	7243.71	1852.52
21	4.86	4.51	0.97	67.13	62.22	13.35	18493.93	17139.88	3676.72	18665.88	17299.24	3710.91
22	47.78	44.95	11.27	27.67	26.03	6.53	16683.78	15695.00	3934.85	16951.42	15946.78	3997.98
23	157.53	147.77	34.62	35.77	33.56	7.86	26292.96	24665.07	5778.67	26740.80	25085.18	5877.10
24	86.74	82.46	22.47	44.28	42.09	11.47	22589.85	21473.24	5852.29	23013.46	21875.91	5962.04
25	49.62	46.29	9.79	2.95	2.75	0.58	24577.29	22926.58	4847.59	24772.94	23109.08	4886.18
26	8.01	7.62	2.45	44.39	42.24	13.58	13244.93	12602.22	4050.44	13390.96	12741.16	4095.09
27	1.75	1.62	0.30	0.0	0.0	0.0	2460.35	2288.70	428.63	2470.84	2298.45	430.46
28	128.53	122.17	27.40	9.03	8.59	1.93	2160.02	2053.25	460.56	2314.67	2200.25	493.53
29	9.39	8.75	2.21	22.62	21.08	5.33	2299.37	2142.93	542.30	2336.69	2177.71	551.11
30	512.19	479.58	79.16	161.35	151.08	24.94	67250.84	62968.95	10394.26	68500.49	64139.04	10587.40
31	29.26	26.92	5.56	54.92	50.34	10.44	6837.65	6267.32	1299.93	6983.05	6400.59	1327.58
32	145.39	133.26	27.64	58.90	53.99	11.20	14802.50	13567.83	2814.16	15123.31	13861.88	2875.15
33	0.0	0.0	0.0	0.0	0.0	0.0	1985.60	1819.98	377.49	1985.43	1820.75	377.65
34	134.80	123.56	25.63	3.04	2.79	0.58	9823.56	9004.18	1867.60	10013.93	9178.67	1903.79
35	698.12	650.61	218.16	301.26	284.21	94.14	101383.14	95644.47	31682.23	103126.89	97289.52	32227.15
36	276.60	264.44	76.62	81.91	78.31	22.69	41552.16	39724.82	11510.29	42197.16	40341.45	11689.96
37	98.19	90.32	21.21	22.36	20.57	4.83	15918.74	14644.65	3438.17	16167.91	14873.89	3491.99
38	59.84	56.24	11.64	27.26	25.62	5.30	7970.10	7490.70	1550.60	8132.73	7643.54	1592.24
39	750.72	709.57	314.11	293.47	277.38	122.79	121618.35	114951.19	50886.34	123481.66	116712.35	51665.97
40	1404.84	1301.99	432.26	558.69	517.79	171.91	153679.08	142427.32	47285.87	156574.63	145110.87	48176.81

Remark: See Table 23 (p. 241) for the 40 sector industrial classification.

TABLE 18

ESTIMATED EMPLOYMENT STATISTICS

FOR YEAR 1974

	OKLAHOMA			ARKANSAS			OK WATER			ARKANS WATER		
	WAGE	LINDEX	HOURS	WAGE	LINDEX	HOURS	WAGE	LINDEX	HOURS	WAGE	LINDEX	HOURS
1	7.00	5.72	3.11	5.81	4.75	2.58	0.97	0.79	0.43	1.58	1.30	0.70
2	0.97	0.79	0.43	16.42	13.42	7.30	0.14	0.12	0.06	3.49	2.85	1.55
3	36.25	29.64	16.11	8.72	7.13	3.88	5.15	4.21	2.29	1.94	1.59	0.85
4	2.29	1.87	1.02	6.57	5.37	2.92	0.06	0.05	0.03	1.26	1.03	0.56
5	64.31	52.58	28.58	62.77	51.32	27.90	1.96	1.60	0.87	17.53	14.33	7.79
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	4.24	3.69	2.17	75.53	61.76	33.57	0.84	0.68	0.37	14.91	12.19	6.63
9	19.32	15.79	3.59	26.98	22.06	11.99	2.58	2.11	1.14	6.27	5.13	2.79
10	164.54	142.70	39.65	264.64	229.52	63.77	44.93	38.97	10.83	156.40	135.64	37.69
11	93.84	81.89	31.39	143.72	125.41	48.07	22.01	19.21	7.36	47.91	41.80	16.02
12	28.75	24.35	7.35	164.86	139.59	42.16	2.10	1.78	0.54	40.35	34.17	10.32
13	15.45	13.54	4.43	89.55	78.48	25.66	7.55	6.62	2.16	60.26	52.81	17.27
14	44.31	38.80	9.95	201.38	176.34	44.75	12.41	10.86	2.76	134.25	117.56	29.83
15	93.26	84.25	18.80	89.78	81.10	18.10	35.73	32.28	7.20	62.95	56.86	12.69
16	19.00	16.45	3.92	90.97	78.76	18.76	5.22	4.52	1.08	8.49	7.35	1.75
17	117.69	103.51	20.90	12.21	10.74	2.17	88.79	78.09	15.77	2.54	2.24	0.45
18	121.44	106.52	30.13	89.03	79.56	22.09	47.18	42.16	11.71	49.75	44.46	12.35
19	5.98	5.38	1.99	57.38	52.10	19.23	1.87	1.68	0.62	10.72	9.65	3.56
20	94.84	82.04	20.98	56.08	48.51	12.41	38.02	32.89	8.41	40.32	34.89	8.92
21	106.49	90.25	19.37	111.91	93.10	15.98	101.41	84.37	18.11	34.73	28.89	6.20
22	193.65	164.39	42.19	135.96	118.23	29.62	128.83	112.02	28.07	105.85	92.04	23.06
23	377.12	327.38	76.65	131.13	113.83	26.65	205.21	178.13	41.71	65.26	74.01	17.33
24	155.21	137.23	37.40	313.55	277.23	75.55	66.52	58.81	16.03	262.47	232.07	63.25
25	139.68	120.33	25.54	87.09	75.34	15.92	80.48	69.62	14.71	83.82	72.51	15.32
26	43.91	38.94	12.32	119.67	106.39	34.19	33.77	30.01	9.65	71.85	63.87	20.53
27	11.26	10.14	1.90	4.08	3.49	0.65	9.28	7.94	1.49	4.08	3.49	0.65
28	237.58	198.81	44.57	17.03	14.27	3.20	25.06	20.97	4.70	3.00	2.51	0.56
29	1.29	1.13	0.29	37.14	32.46	8.22	0.23	0.20	0.05	4.68	4.09	1.03
30	825.52	739.71	122.12	537.52	481.65	79.52	270.72	242.59	40.05	359.63	322.25	53.20
31	60.42	51.55	10.69	96.31	82.18	17.05	27.85	23.77	4.93	33.24	32.63	6.77
32	211.94	180.34	37.51	137.81	117.59	24.39	53.10	45.31	9.40	73.80	62.97	13.06
33	0.0	0.0	0.0	1.79	1.53	0.32	0.0	0.0	0.0	1.79	1.53	0.32
34	179.63	152.27	31.79	26.42	22.54	4.63	33.80	28.84	5.98	23.12	19.73	4.05
35	1172.25	1020.24	337.83	745.95	649.21	214.97	404.38	351.94	116.54	414.48	360.73	119.45
36	445.65	403.67	110.97	255.35	231.29	67.02	144.24	130.65	37.86	166.73	151.02	43.76
37	177.29	148.71	34.89	106.97	89.74	21.06	64.86	54.41	12.77	81.62	68.47	16.07
38	100.29	92.64	19.40	65.36	57.59	11.93	43.13	38.00	7.87	36.58	32.23	6.68
39	1362.25	1089.10	481.78	765.76	660.71	292.27	456.52	393.89	174.25	438.76	378.56	167.46
40	2147.32	1678.67	624.22	1050.60	919.16	305.41	617.62	540.35	179.54	415.02	363.09	120.64

Remark: See Table 23 (p. 241) for the 40 sector industrial classification.

TABLE 18 (continued) ESTIMATED EMPLOYMENT STATISTICS

FOR YEAR 1974

	OK NONWATER			ARK NONWATER			REST U.S.A.			U.S.A.		
	WAGE	LINDEX	HOURS	WAGE	LINDEX	HOURS	WAGE	LINDEX	HOURS	WAGE	LINDEX	HOURS
1	6.03	4.93	2.68	4.22	3.45	1.88	814.95	666.36	362.20	827.76	676.83	367.89
2	0.83	0.68	0.37	12.93	10.57	5.75	130.25	106.50	57.89	147.63	120.71	65.62
3	31.10	25.43	13.82	6.78	5.54	3.01	1174.04	959.97	521.80	1219.01	996.74	541.78
4	2.22	1.82	0.99	5.31	4.34	2.36	119.24	97.50	53.00	128.10	104.74	56.93
5	62.35	50.98	27.71	45.24	36.99	20.11	2865.48	2343.00	1273.55	2992.56	2446.90	1330.03
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	4.04	3.31	1.80	60.62	49.57	26.94	819.26	669.88	364.12	899.67	735.63	399.85
9	16.74	13.69	7.44	20.71	16.93	9.20	7580.33	6198.15	3369.04	7626.63	6236.00	3399.61
10	119.61	103.73	28.82	108.24	93.88	26.08	19965.85	17316.44	4811.05	20395.03	17688.67	4914.47
11	71.83	62.68	24.02	95.81	83.61	32.04	17545.95	15310.60	5868.21	17783.52	15517.90	5947.66
12	26.65	22.57	6.82	124.51	105.43	31.84	6044.72	5118.30	1545.96	6238.33	5282.24	1595.48
13	7.90	6.92	2.26	29.29	25.67	8.39	4153.75	3640.44	1190.18	4258.74	3732.46	1220.27
14	31.90	27.94	7.09	67.13	58.78	14.92	8834.57	7736.05	1963.24	9080.26	7951.19	2017.84
15	57.53	51.97	11.60	26.83	24.24	5.41	12825.76	11586.05	2585.84	13008.80	11751.40	2622.74
16	13.79	11.93	2.84	82.48	71.41	17.01	15129.08	13098.77	3119.40	15239.05	13193.98	3142.07
17	28.90	25.42	5.13	9.67	8.50	1.72	3929.38	3455.92	697.94	4059.29	3570.17	721.01
18	74.26	66.36	18.43	39.28	35.10	9.75	7451.99	6659.51	1849.13	7662.45	6847.59	1901.35
19	4.11	3.70	1.37	47.16	42.45	15.67	1905.01	1714.68	632.89	1968.87	1772.16	654.11
20	55.83	49.16	12.57	15.76	13.63	3.49	8050.94	6964.48	1781.18	8201.86	7095.04	1814.57
21	7.07	5.88	1.26	77.18	64.21	13.78	21421.69	17821.71	3825.30	21642.08	18005.05	3864.66
22	64.82	56.37	14.12	30.11	26.19	6.56	18008.18	15659.28	3923.35	18337.79	15945.90	3995.16
23	171.91	149.23	34.94	45.86	39.81	9.32	29984.11	26027.87	6094.33	30492.36	26469.06	6197.63
24	88.69	78.42	21.37	51.08	45.16	12.31	24114.50	21321.39	5810.72	24583.26	21735.86	5923.68
25	59.20	51.21	10.82	3.27	2.83	0.60	23753.16	20547.72	4342.44	23979.94	20743.89	4383.90
26	10.04	8.93	2.87	47.82	42.51	13.66	14519.30	12906.04	4148.37	14682.78	13051.36	4195.08
27	2.59	2.20	0.41	0.0	0.0	0.0	3469.60	2968.01	556.03	3485.54	2981.64	558.58
28	212.52	177.84	39.87	14.05	11.76	2.64	3571.10	2988.37	670.00	3825.73	3201.45	717.77
29	1.06	0.92	0.23	32.46	28.37	7.18	2600.18	2272.89	575.26	2638.61	2306.48	583.76
30	554.80	497.13	82.07	177.90	159.41	26.32	70490.39	63163.43	10427.57	71853.43	64384.79	10629.21
31	32.56	27.78	5.76	58.07	49.55	10.28	7220.31	6160.68	1277.93	7377.05	6294.41	1305.67
32	158.84	135.53	28.11	64.01	54.62	11.33	15840.31	13515.62	2803.59	16190.06	13814.05	2865.50
33	0.0	0.0	0.0	0.0	0.0	0.0	2179.06	1859.27	385.68	2180.85	1860.80	385.99
34	145.83	124.43	25.81	3.30	2.82	0.58	10757.48	9178.73	1903.98	10963.53	9354.55	1940.45
35	767.87	668.30	221.29	331.46	288.48	95.52	111108.26	96699.97	32019.67	113026.46	98369.42	32572.47
36	301.42	273.02	79.11	88.62	80.27	23.26	43905.67	39769.63	11523.80	44606.67	40404.60	11707.79
37	112.40	94.30	22.13	25.35	21.27	4.99	17387.24	14586.61	3422.68	17671.47	14825.06	3478.64
38	63.15	55.64	11.52	28.77	25.35	5.25	8583.68	7562.71	1566.36	8755.32	7713.94	1597.69
39	805.74	695.20	307.53	327.00	282.14	124.81	133586.11	115259.80	50987.07	135614.13	117009.61	51761.12
40	1529.70	1330.32	444.68	635.59	556.07	184.76	166975.25	146085.09	48539.32	170173.17	148882.91	49468.95

Remark: See Table 23 (p. 241) for the 40 sector industrial classification.

TABLE 19

ESTIMATED EMPLOYMENT STATISTICS

FOR YEAR 1975

	OKLAHOMA			ARKANSAS			OK WATER			ARKANS WATER		
	WAGE	LINDEX	HOURS	WAGE	LINDEX	HOURS	WAGE	LINDEX	HOURS	WAGE	LINDEX	HOURS
1	6.03	4.57	2.40	5.63	4.28	2.32	0.04	0.63	0.34	1.54	1.16	0.63
2	0.57	0.73	0.40	17.43	13.19	7.17	0.14	0.11	0.06	3.70	2.80	1.52
3	33.06	25.02	13.[illegible]	12.83	9.71	5.28	4.70	3.56	1.93	2.36	2.16	1.18
4	1.88	1.42	0.77	13.42	10.16	5.52	0.05	0.04	0.02	2.58	1.95	1.06
5	61.79	46.77	25.43	54.21	41.03	22.31	1.88	1.43	0.77	15.14	11.46	6.23
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	4.55	3.44	1.87	41.72	31.58	17.17	0.78	0.59	0.32	8.24	6.23	3.39
9	18.03	13.65	7.42	21.03	15.92	8.66	2.40	1.82	0.99	4.89	3.70	2.01
10	174.10	131.79	38.10	275.26	216.91	60.23	47.54	37.46	10.40	162.67	128.19	35.60
11	91.72	70.05	29.75	136.62	111.80	42.83	21.51	17.61	6.74	45.54	37.27	14.28
12	27.64	21.37	6.46	157.30	121.65	36.75	2.02	1.56	0.47	38.50	29.78	9.00
13	15.04	12.31	4.02	74.02	60.42	19.74	7.37	6.02	1.97	49.80	40.66	13.29
14	42.61	33.66	8.54	204.31	161.78	41.04	11.93	9.42	2.39	136.54	107.85	27.36
15	105.37	88.96	19.35	98.56	74.05	16.52	40.76	34.08	7.61	62.09	51.92	11.58
16	21.29	16.93	3.96	114.89	89.53	21.40	5.85	4.58	1.09	10.73	8.39	2.00
17	147.91	114.04	23.04	60.57	46.70	9.43	111.58	86.03	17.38	12.62	9.73	1.97
18	136.74	113.20	31.43	96.94	80.25	22.28	53.12	43.98	12.21	54.17	44.84	12.45
19	5.70	5.02	2.07	59.60	50.00	18.45	2.09	1.76	0.65	11.04	9.26	3.42
20	118.42	94.66	24.22	58.88	47.07	12.04	47.47	37.94	9.71	42.34	33.84	8.66
21	67.95	51.32	11.01	77.89	58.83	12.62	63.52	47.97	10.29	24.17	18.26	3.92
22	200.75	162.91	40.82	150.52	123.13	30.86	136.68	108.37	27.16	121.07	95.86	24.02
23	492.74	360.75	84.47	135.15	107.89	25.21	246.36	196.30	45.96	87.88	70.02	16.40
24	175.27	141.44	28.49	271.70	217.71	59.32	75.54	60.53	16.49	227.44	182.24	49.66
25	130.50	109.44	22.51	71.96	56.53	11.95	78.07	61.33	12.97	69.26	54.41	11.50
26	49.00	40.27	12.95	113.59	93.15	29.97	37.84	31.04	9.95	65.20	55.95	17.99
27	22.96	16.95	3.18	6.75	4.98	0.93	17.97	13.27	2.49	6.75	4.98	0.93
28	251.66	185.60	41.63	20.11	14.82	3.32	26.58	19.58	4.39	3.54	2.61	0.59
29	12.27	9.37	2.50	36.38	29.27	7.41	2.21	1.78	0.45	4.58	3.69	0.93
30	965.18	723.40	119.34	578.93	484.05	79.85	283.72	237.23	39.13	387.33	323.85	53.42
31	68.44	51.51	10.68	99.18	79.03	16.39	29.81	23.76	4.93	39.38	31.38	6.51
32	215.53	174.10	36.12	140.47	111.93	23.22	54.74	43.62	9.05	75.22	59.94	12.43
33	0.0	0.0	0.0	2.60	2.07	0.43	0.0	0.0	0.0	2.60	2.07	0.43
34	175.25	150.09	32.27	26.87	21.41	4.44	36.74	29.27	6.07	23.51	18.73	3.89
35	1417.09	1140.98	377.89	857.32	690.28	223.62	428.84	393.59	130.36	476.37	383.55	127.03
36	496.28	413.17	119.92	279.95	233.88	67.79	160.30	133.92	38.81	182.80	152.71	44.26
37	197.22	148.90	34.95	124.27	92.88	21.80	72.90	54.48	12.79	94.82	70.87	16.64
38	183.84	137.78	22.31	86.09	69.43	14.37	54.23	43.74	9.05	48.19	38.87	8.05
39	1462.62	1177.73	520.07	856.70	698.87	309.15	529.46	425.95	188.42	497.74	400.43	177.13
40	2566.07	1937.81	642.95	1220.94	999.95	331.76	680.54	557.36	184.93	482.30	395.01	131.06

Remark: See Table 23 (p. 241) for the 40 sector industrial classification.

TABLE 19 (continued) ESTIMATED EMPLOYMENT STATISTICS

FOR YEAR 1975

OK NONWATER			ARK NONWATER			REST U.S.A.			U.S.A.		
WAGE	LINDEX	HOURS	WAGE	LINDEX	HOURS	WAGE	LINDEX	HOURS	WAGE	LINDEX	HOURS
5.19	3.93	2.14	4.10	3.10	1.69	912.32	690.63	375.44	923.99	699.46	380.24
0.83	0.63	0.34	13.73	10.39	5.55	154.03	116.64	63.41	172.49	130.57	70.98
28.36	21.47	11.67	9.97	7.55	4.10	1282.49	970.85	527.77	1328.38	1005.56	546.66
1.82	1.39	0.75	10.84	8.21	4.46	93.92	71.10	38.65	109.22	82.68	44.95
59.69	45.35	24.65	39.07	29.58	16.08	2700.84	2044.54	1111.46	2816.83	2132.35	1159.19
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3.77	2.85	1.55	33.48	25.35	13.78	848.14	490.64	266.72	694.41	525.67	285.77
15.62	11.83	6.43	16.14	12.22	6.64	8418.89	5373.12	3464.56	8457.95	6402.69	3480.84
126.55	99.73	27.69	112.59	88.72	24.64	21607.15	17026.91	4728.04	22056.51	17391.01	4826.37
76.21	57.48	22.61	91.08	74.53	28.55	17220.96	14092.44	5398.42	17449.30	14279.30	5470.00
25.62	19.91	5.99	118.80	91.88	27.76	6333.46	4693.26	1479.78	6518.39	5041.29	1522.99
7.71	6.29	2.06	24.21	19.76	6.45	3654.45	2983.22	974.52	3743.54	3055.95	998.28
30.68	24.23	6.15	68.27	53.93	13.68	8969.35	7084.80	1797.47	9216.77	7280.23	1847.05
66.63	54.57	12.24	26.47	22.13	4.94	13410.46	11212.76	2501.95	13605.41	11375.76	2539.32
15.44	12.07	2.87	104.17	81.44	19.40	15903.31	12434.17	2961.51	16039.49	12540.65	2986.87
36.32	28.91	5.55	47.95	36.97	7.47	4259.39	3284.03	663.46	4067.86	3444.77	695.93
82.62	69.22	19.22	42.77	35.40	9.83	7286.43	6031.81	1675.04	7520.11	6225.26	1728.76
4.61	3.96	1.43	48.56	40.74	15.03	1828.80	1534.23	566.19	1893.10	1589.05	586.72
70.95	56.72	14.51	16.54	13.22	3.38	8020.55	6411.31	1640.19	8197.85	6553.04	1676.45
4.43	3.35	0.72	53.72	40.57	8.71	19707.44	14834.77	3194.07	19853.28	14994.92	3217.71
68.89	54.55	13.67	34.45	27.27	6.83	19587.05	15508.35	3886.32	19949.32	15794.39	3959.00
205.38	164.45	38.50	47.27	37.67	8.82	30882.00	24607.17	5761.57	31469.89	25075.61	5871.25
100.73	80.71	21.99	44.26	35.47	9.66	22900.07	18349.41	5000.01	23348.04	18700.37	5097.83
57.43	45.11	9.54	2.70	2.12	0.45	23090.28	18138.47	3835.59	23297.74	18301.44	3870.06
11.25	9.23	2.97	45.39	37.24	11.99	15854.51	13005.16	4183.25	16017.19	13139.62	4226.17
3.99	3.69	0.69	0.0	0.0	0.0	4465.42	3297.95	617.62	4495.13	3319.89	621.73
225.29	165.02	37.24	16.57	12.21	2.74	3980.67	2933.44	657.96	4252.64	3133.85	702.92
10.06	8.09	2.05	31.00	25.58	6.49	2892.80	2327.27	599.16	2941.45	2366.41	609.07
591.45	456.17	80.20	191.60	160.20	26.43	69186.35	57848.12	9542.94	70630.45	59055.57	9742.13
24.83	27.75	5.76	59.80	47.65	9.88	7165.57	5709.62	1184.39	7329.39	5840.15	1211.47
163.76	130.49	27.07	65.25	51.99	10.78	15464.42	12322.25	2556.10	15823.40	12608.28	2615.44
0.0	0.0	0.0	0.0	0.0	0.0	2270.69	1809.31	375.32	2273.28	1811.39	375.75
158.51	126.30	25.20	3.36	2.68	0.56	11537.08	9192.89	1906.96	11759.19	9369.86	1943.67
928.25	747.33	247.53	390.96	306.73	101.59	119039.21	95844.77	31743.79	121313.62	97676.02	32350.30
334.99	279.85	91.11	97.15	81.17	23.52	47111.85	39358.27	11407.23	47887.09	40005.91	11594.93
126.33	94.41	22.16	29.45	22.01	5.17	19625.03	14667.44	3442.99	19948.53	14909.21	3499.74
79.81	64.04	13.26	37.90	30.57	6.33	9262.47	7469.74	1546.32	9482.21	7646.94	1583.01
934.47	751.79	332.55	370.96	298.44	132.02	148073.40	119125.83	52695.16	150406.03	121002.43	53525.28
1585.53	1300.45	458.02	738.64	604.94	200.72	183622.19	150386.73	49897.34	187209.20	153324.49	50872.07

Remark: See Table 23 (p. 241) for the 40 sector industrial classification.

TABLE 20

ESTIMATED EMPLOYMENT STATISTICS

FOR YEAR 1976

	OKLAHOMA			ARKANSAS			OK WATER			ARKANS WATER		
	WAGE	LINDEX	HOURS	WAGE	LINDEX	HOURS	WAGE	LINDEX	HOURS	WAGE	LINDEX	HOURS
1	8.29	4.35	2.36	4.82	3.33	1.81	0.87	0.60	0.33	1.31	0.91	0.49
2	0.93	0.64	0.35	14.44	9.98	5.43	0.14	0.09	0.05	3.07	2.12	1.15
3	34.02	23.53	12.79	9.67	6.69	3.63	4.84	3.35	1.82	2.15	1.49	0.81
4	1.63	1.13	0.61	9.64	6.66	3.62	0.05	0.03	0.02	1.85	1.28	0.70
5	41.47	28.68	15.59	45.58	31.52	17.14	1.26	0.87	0.48	12.73	8.80	4.78
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	5.53	3.13	1.70	44.51	30.78	16.73	0.78	0.54	0.29	8.79	6.08	3.30
9	12.46	10.75	6.94	21.61	14.94	8.12	2.45	1.70	0.93	5.02	3.47	1.89
10	177.18	123.36	35.72	299.23	217.15	60.33	48.38	35.11	9.75	176.84	128.33	35.65
11	126.72	92.36	36.40	161.82	123.81	47.45	28.32	21.66	8.30	53.94	41.27	15.82
12	33.46	21.41	6.47	186.09	130.77	39.51	2.22	1.56	0.47	65.55	32.01	9.67
13	18.52	14.24	4.55	97.59	75.01	24.52	9.06	6.96	2.28	65.67	50.48	16.50
14	52.87	38.26	9.74	244.52	177.44	45.03	14.80	10.74	2.73	163.01	118.30	30.02
15	112.13	83.29	19.71	96.31	77.41	17.28	42.96	33.83	7.55	68.93	54.27	12.11
16	24.21	17.27	4.11	133.47	95.34	22.69	6.66	4.75	1.13	12.48	8.90	2.12
17	171.47	115.91	24.02	61.09	42.36	8.55	129.36	89.71	18.12	12.73	8.83	1.79
18	144.39	114.10	31.69	133.40	103.97	28.87	55.87	44.33	12.31	74.55	58.10	16.14
19	7.62	5.00	2.21	67.50	53.19	19.62	2.38	1.88	0.69	12.50	9.85	3.63
20	157.81	116.04	29.69	70.22	51.90	13.27	62.93	46.51	11.90	50.49	37.32	9.54
21	81.67	55.98	12.01	110.40	75.66	16.23	76.35	52.33	11.23	34.26	23.48	5.04
22	216.31	161.14	40.39	181.90	133.66	33.50	145.89	107.20	26.87	141.61	104.05	26.08
23	470.22	345.57	81.63	149.65	110.93	25.98	255.87	189.67	44.42	97.30	72.13	16.89
24	249.14	186.21	50.74	314.22	234.85	64.00	106.78	79.80	21.75	263.03	196.59	53.57
25	167.82	121.34	28.66	87.00	62.91	13.30	96.69	69.91	14.78	83.74	60.55	12.80
26	85.93	63.31	13.92	91.43	70.93	22.80	43.03	33.38	10.73	54.89	42.59	13.69
27	27.42	18.78	3.52	5.15	5.50	1.03	21.77	14.70	2.75	8.15	5.50	1.03
28	311.47	210.73	47.26	25.39	17.18	3.85	32.65	22.23	4.99	4.47	3.02	0.68
29	10.81	10.14	3.57	43.65	32.05	8.11	2.49	1.83	0.46	5.50	4.04	1.02
30	891.73	705.63	116.11	639.15	504.46	83.22	292.44	230.81	38.08	427.62	337.50	55.69
31	58.51	51.36	10.66	114.19	85.60	17.76	31.60	23.69	4.91	45.34	33.99	7.05
32	239.21	179.33	37.20	155.93	116.89	24.25	59.93	44.92	9.32	83.50	62.60	12.99
33	0.0	0.0	0.0	2.57	1.93	0.40	0.0	0.0	0.0	2.57	1.93	0.40
34	226.72	171.61	35.58	33.62	25.20	5.23	43.05	32.27	6.70	29.42	22.05	4.58
35	1497.48	1114.96	389.64	958.35	728.79	241.40	506.23	384.96	127.51	532.51	404.95	134.13
36	543.05	405.64	128.55	322.10	254.83	73.68	175.76	139.05	40.31	210.32	166.39	48.24
37	253.13	156.05	36.61	146.72	98.60	23.14	84.94	57.08	13.40	111.95	75.24	17.66
38	180.27	110.65	22.91	95.26	70.14	14.52	60.98	44.91	9.30	53.32	39.27	8.13
39	1582.44	1169.13	513.66	976.15	727.93	322.16	565.09	421.39	186.50	559.30	417.08	184.59
40	2601.11	2050.75	681.64	1352.16	1053.90	350.30	756.77	589.85	196.05	534.14	416.32	138.38

Remark: See Table 23 (p. 241) for the 40 sector industrial classification.

TABLE 20 (continued)

FOR YEAR 1975

	OK NONWATER			ARK NONWATER			REST U.S.A.			U.S.A.		
	WAGE	LINDEX	HOURS	WAGE	LINDEX	HOURS	WAGE	LINDEX	HOURS	WAGE	LINDEX	HOURS
1	5.41	3.74	2.03	3.50	2.42	1.32	925.33	639.92	347.87	936.43	647.60	352.04
2	0.79	0.55	0.30	11.37	7.86	4.27	142.24	98.37	53.47	157.60	108.99	59.25
3	29.19	20.18	10.97	7.51	5.20	2.83	1235.70	854.56	464.55	1279.39	884.78	480.97
4	1.58	1.09	0.60	7.78	5.38	2.93	134.54	93.04	50.58	143.30	100.83	54.81
5	40.21	27.81	15.12	32.85	22.72	12.35	2390.97	1653.50	898.86	2470.02	1713.71	931.59
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	3.75	2.60	1.41	35.72	24.70	13.43	729.49	504.49	274.24	770.52	530.40	292.68
9	16.00	11.06	6.01	16.58	11.47	6.23	8555.39	5916.59	3215.31	8595.46	5944.30	3231.37
10	120.78	93.45	25.96	122.39	88.82	24.68	23024.88	17289.46	4803.40	24301.26	17635.17	4890.43
11	92.40	70.70	27.10	107.88	82.54	31.64	19874.53	15206.22	5829.31	20157.06	15822.39	5911.16
12	28.24	19.84	6.00	140.54	93.76	29.84	7682.90	5399.08	1631.19	7899.44	5551.26	1677.15
13	9.47	7.28	2.38	31.92	24.54	8.02	4205.94	3232.35	1056.77	4322.06	3322.10	1085.94
14	38.06	27.62	7.01	81.51	59.15	15.01	10451.04	7584.21	1924.68	10748.42	7800.01	1979.45
15	69.17	54.46	12.16	29.38	23.13	5.16	14790.51	11646.07	2599.39	15009.94	11811.76	2636.37
16	17.56	12.32	2.98	121.19	86.44	20.57	17776.98	12679.73	3018.16	17934.85	12792.34	3044.97
17	42.11	29.20	5.99	48.36	33.54	6.77	4826.88	3347.35	676.03	5059.43	3508.62	708.69
18	69.52	69.77	19.35	58.85	45.87	12.74	8471.17	5602.53	1833.59	8750.96	5820.70	1894.15
19	5.24	4.13	1.52	55.00	43.34	15.99	2119.05	1669.86	616.00	2194.17	1729.06	637.81
20	94.07	69.53	17.78	19.73	14.58	3.73	8983.57	6639.74	1698.22	9210.80	6807.69	1741.17
21	5.22	3.65	0.78	76.13	52.18	11.20	22115.03	15157.66	3252.21	22307.10	15289.31	3289.45
22	70.41	53.94	13.52	40.29	29.60	7.42	22030.04	16186.66	4057.10	22431.25	16481.45	4133.99
23	214.35	156.89	37.21	52.34	38.60	9.09	33956.85	25171.87	5895.29	34576.71	25631.37	6002.59
24	142.37	105.40	29.00	51.19	38.26	10.43	25649.65	19170.14	5223.96	26213.02	19591.20	5333.70
25	71.13	51.43	10.88	3.27	2.36	0.50	29597.43	21400.89	4525.60	29852.25	21585.14	4554.56
26	12.50	9.93	3.19	36.53	28.34	9.11	17887.16	13876.78	4460.64	18034.42	13991.02	4497.36
27	6.05	4.00	0.76	0.0	0.0	0.0	5144.82	3473.89	650.42	5180.79	3498.17	654.97
28	278.61	183.51	42.23	20.92	14.15	3.17	4455.36	3014.45	676.08	4792.21	3242.36	727.19
29	11.33	8.32	2.11	38.15	28.01	7.09	3151.14	2313.61	585.71	3209.60	2355.80	596.39
30	599.32	473.02	78.04	211.53	166.95	27.54	75412.70	59520.68	9819.36	76043.60	60728.97	10018.73
31	35.92	27.57	5.74	68.85	51.61	10.71	7849.59	5884.25	1220.78	8032.29	6021.21	1249.19
32	179.29	134.39	27.88	72.43	54.29	11.26	17459.10	13087.78	2715.26	17854.24	13383.92	2776.71
33	0.0	0.0	0.0	0.0	0.0	0.0	2497.80	1872.41	388.45	2500.37	1874.34	388.85
34	185.74	139.24	28.89	4.20	3.15	0.65	12701.20	9521.14	1975.30	12963.61	9717.85	2016.11
35	961.26	730.99	242.13	425.85	323.04	107.27	132399.33	100683.90	33349.95	134825.18	102528.65	33961.09
36	387.30	290.53	84.24	111.78	88.44	25.64	53285.30	42156.09	12221.40	54150.46	42940.55	12419.93
37	147.19	93.92	23.22	34.77	23.37	5.48	21986.33	14775.76	3467.88	22365.18	15030.37	3527.63
38	89.29	65.75	13.61	41.93	30.88	6.39	10322.64	7601.36	1573.57	10568.17	7782.16	1611.09
39	997.35	743.74	329.16	416.85	310.85	137.57	163727.16	122093.34	54035.37	166265.75	123906.39	54873.19
40	1974.34	1460.51	485.55	818.02	637.58	211.92	196994.28	153541.92	51034.79	200977.56	156646.58	52066.72

Remark: See Table 23 (p. 241) for the 40 sector industrial classification.

TABLE 21

ESTIMATED EMPLOYMENT STATISTICS

FOR YEAR 1977

	OKLAHOMA			ARKANSAS			OK WATER			ARKANS WATER		
	WAGE	LINDEX	HOURS	WAGE	LINDEX	HOURS	WAGE	LINDEX	HOURS	WAGE	LINDEX	HOURS
1	5.57	3.63	1.97	5.74	3.68	2.00	0.79	0.50	0.27	1.57	1.00	0.55
2	0.82	0.53	0.29	16.29	10.44	5.68	0.12	0.08	0.04	3.46	2.22	1.21
3	20.16	13.05	9.81	15.20	9.81	5.33	4.00	2.57	1.39	3.41	2.18	1.19
4	1.99	1.26	0.68	12.20	7.82	4.25	0.06	0.04	0.02	2.34	1.50	0.82
5	50.52	27.59	15.16	53.92	34.57	18.79	1.33	0.85	0.46	15.06	9.65	5.25
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	4.78	3.06	1.66	41.25	26.44	14.37	0.82	0.52	0.29	8.14	5.22	2.84
9	16.92	10.36	5.89	24.83	15.92	8.65	2.26	1.45	0.79	5.77	3.70	2.01
10	182.57	123.11	34.19	287.15	193.63	53.77	49.26	33.62	9.34	169.70	114.43	31.78
11	119.53	86.16	33.02	181.41	130.79	50.11	28.04	20.21	7.75	60.47	43.60	16.70
12	42.60	27.86	6.42	198.67	129.93	39.26	3.11	2.03	0.61	48.63	31.80	9.61
13	20.81	14.33	4.86	112.35	79.96	26.13	10.22	7.27	2.38	75.60	53.81	17.58
14	45.43	30.23	7.67	275.83	183.52	46.59	12.72	8.46	2.15	183.89	122.35	31.06
15	123.42	90.41	20.27	116.88	85.00	19.19	47.29	34.80	7.76	81.95	60.30	13.46
16	30.26	19.90	4.74	112.32	74.17	17.66	8.32	5.47	1.30	10.53	6.93	1.65
17	234.05	155.44	31.61	23.71	15.20	3.07	184.12	118.02	23.85	4.94	3.17	0.64
18	205.44	144.48	40.13	131.97	92.80	25.77	79.21	56.13	15.59	73.75	51.85	14.40
19	9.62	7.09	2.62	70.14	52.22	19.27	2.90	2.22	0.82	12.99	9.67	3.57
20	114.42	77.68	19.86	78.18	53.08	13.57	45.86	31.14	7.96	56.22	38.17	9.76
21	85.72	53.61	11.51	157.23	98.33	21.10	80.13	50.11	10.76	48.80	30.52	6.55
22	296.54	203.95	51.13	236.32	161.42	40.47	198.63	135.68	34.01	183.98	125.67	31.50
23	479.69	339.50	77.40	232.51	160.20	37.52	261.13	179.84	42.12	151.25	104.17	24.40
24	251.47	173.70	48.96	436.35	301.06	82.03	112.06	77.02	20.98	366.69	252.02	68.67
25	219.43	143.89	30.42	86.46	56.95	12.04	125.65	82.91	17.53	83.21	54.82	11.59
26	69.73	50.32	14.08	151.95	108.93	35.01	53.79	38.56	12.39	91.23	65.40	21.02
27	41.63	26.28	4.92	8.41	5.31	0.99	32.58	20.57	3.85	8.41	5.31	0.99
28	391.59	244.89	54.92	28.62	17.90	4.01	41.30	25.83	5.79	5.03	3.15	0.71
29	16.11	10.90	2.76	44.71	30.25	7.66	2.90	1.96	0.50	5.63	3.81	0.96
30	1098.54	797.70	131.66	758.19	578.69	95.55	347.13	261.59	43.18	513.95	387.30	63.92
31	72.20	50.28	10.43	120.33	83.79	17.39	33.30	23.19	4.81	47.76	33.27	6.90
32	276.09	193.66	40.19	177.07	123.31	25.59	69.67	48.52	10.07	94.82	66.03	13.70
33	0.0	0.0	0.0	2.59	1.80	0.37	0.0	0.0	0.0	2.59	1.80	0.37
34	265.31	184.76	38.34	34.14	23.77	4.93	49.92	34.77	7.21	29.87	20.80	4.32
35	1682.63	1170.66	387.58	1070.35	755.37	250.09	572.23	403.83	133.70	594.74	419.72	138.96
36	613.50	460.24	133.37	369.02	276.83	80.22	198.56	148.96	43.17	240.95	180.76	52.38
37	256.65	159.93	37.55	166.91	103.93	24.40	93.98	58.52	13.74	127.36	79.30	18.62
38	164.94	112.97	23.40	103.50	70.89	14.68	66.94	45.85	9.49	57.94	39.68	8.22
39	1734.64	1233.34	545.76	1116.12	771.34	341.32	645.45	446.06	197.39	639.50	441.95	195.57
40	2658.36	2094.11	694.93	1470.74	1078.25	357.84	821.56	602.32	199.89	580.98	425.94	141.36

Remark: See Table 23 (p. 241) for the 40 sector industrial classification.

TABLE 21 (continued)

ESTIMATED EMPLOYMENT STATISTICS

FOR YEAR 1977

	OK NONWATER			ARK NONWATER			REST U.S.A.			U.S.A.		
	WAGE	LINDEX	HOURS	WAGE	LINDEX	HOURS	WAGE	LINDEX	HOURS	WAGE	LINDEX	HOURS
1	4.88	3.13	1.70	4.13	2.68	1.46	1004.23	643.74	349.01	1015.64	651.05	353.02
2	0.70	0.45	0.25	12.73	8.22	4.47	151.04	95.82	52.63	168.15	107.79	58.59
3	24.16	15.48	8.42	11.99	7.62	4.14	1277.19	813.71	445.01	1320.64	846.56	460.15
4	1.90	1.22	0.66	9.85	6.32	3.43	158.23	101.43	55.13	172.38	110.50	60.06
5	42.19	27.04	14.70	38.87	24.91	13.54	2270.81	1455.65	791.22	2358.25	1518.11	825.17
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	3.98	2.54	1.38	33.11	21.22	11.54	784.62	502.96	273.39	830.65	532.47	289.42
9	14.66	9.40	5.11	19.06	12.22	6.64	9481.97	6078.19	3303.82	9523.72	6104.55	3318.37
10	132.71	89.49	24.85	117.45	79.20	21.99	26039.54	17558.90	4876.38	26599.55	17875.63	4966.34
11	91.49	65.97	25.27	120.94	87.19	33.41	21220.65	15299.67	5862.06	21521.59	15516.65	5945.19
12	39.49	25.92	7.80	150.04	98.13	29.65	9027.69	5904.31	1784.13	9268.95	6062.10	1831.81
13	10.69	7.61	2.49	36.75	26.16	8.55	4740.48	3373.98	1102.43	4873.71	3468.83	1133.42
14	37.71	21.76	5.53	91.94	61.17	15.53	11683.71	7773.59	1973.60	12004.97	7957.34	2027.87
15	76.13	55.02	12.50	34.93	25.70	5.74	16088.06	11838.16	2641.72	16328.35	12014.97	2681.17
16	21.94	14.43	3.43	102.28	67.25	16.01	19066.01	13061.15	3108.92	29009.09	13155.22	3131.31
17	59.94	39.42	7.76	18.77	12.03	2.43	5463.81	3502.44	707.75	5731.57	3674.05	742.63
18	125.63	88.35	24.54	58.22	40.94	11.37	10256.68	7212.86	2003.26	10394.09	7450.13	2069.16
19	8.56	4.88	1.80	57.15	42.55	15.70	2167.35	1613.81	595.43	2247.01	1673.13	617.31
20	69.56	46.54	11.90	21.97	14.91	3.81	10204.63	5927.80	1771.64	10397.25	7058.55	1805.09
21	5.56	3.49	0.75	108.43	67.81	14.55	25240.47	15785.16	3387.93	25483.42	15937.10	3420.59
22	69.65	58.27	17.11	52.34	35.75	8.95	24699.37	16871.16	4229.34	25234.28	17236.53	4320.94
23	218.76	150.66	35.28	81.36	56.03	13.12	38305.41	26381.82	6178.45	39018.91	26872.53	6293.37
24	142.41	102.59	27.98	71.36	49.05	13.36	29360.13	20178.78	5498.15	30059.65	20659.55	5529.15
25	92.59	60.99	12.89	3.25	2.14	0.45	36652.71	24145.39	5104.83	36937.59	24346.24	5147.33
26	16.30	11.47	3.69	60.72	43.53	13.99	20406.27	14628.15	4701.90	20628.01	14787.10	4753.00
27	9.05	5.71	1.07	0.0	0.0	0.0	5496.57	3470.06	649.71	5546.61	3501.65	653.63
28	350.29	219.06	49.13	23.59	14.75	3.31	5641.99	3529.45	791.30	6062.19	3791.24	850.24
29	13.21	8.94	2.26	39.08	26.44	6.69	3305.15	2236.23	565.95	3365.97	2277.38	576.36
30	711.41	535.13	88.46	254.24	191.59	31.62	86296.32	65031.14	10733.37	88123.05	66407.72	10960.58
31	38.90	27.09	5.62	72.55	50.52	10.48	8668.61	6036.63	1252.89	8861.13	6170.71	1280.51
32	209.42	145.14	30.12	82.25	57.28	11.89	20307.97	14142.04	2934.68	20763.14	14459.01	3000.45
33	0.0	0.0	0.0	0.0	0.0	0.0	2690.61	1873.69	388.82	2693.20	1875.49	389.19
34	213.39	149.09	31.13	4.27	2.97	0.62	14815.06	10316.89	2140.90	15114.51	10525.42	2184.18
35	1096.59	766.83	253.98	475.62	335.65	111.13	142819.40	100789.98	33369.02	145548.58	102716.01	34006.68
36	414.04	311.28	90.20	128.06	96.07	27.84	63700.22	47787.11	13847.87	64682.74	48524.18	14061.46
37	162.57	101.41	23.81	39.53	24.63	5.78	24723.11	15394.21	3614.49	25146.87	15658.08	3676.44
38	98.00	67.13	13.90	45.56	31.21	6.46	11556.06	7915.11	1639.16	11824.50	8098.97	1677.23
39	1136.19	787.28	348.38	476.62	329.39	145.76	185584.29	129234.52	56753.60	188485.06	130259.20	57640.69
40	2034.91	1491.79	495.09	809.76	652.31	216.49	212191.64	155565.72	51628.14	216518.74	158739.08	52680.96

Remark: See Table 23 (p. 241) for the 40 sector industrial classification.

TABLE 22

ESTIMATED EMPLOYMENT STATISTICS

FOR YEAR 1978

	OKLAHOMA			ARKANSAS			OK WATER			ARKANS WATER		
	WAGE	LINDEX	HOURS	WAGE	LINDEX	HOURS	WAGE	LINDEX	HOURS	WAGE	LINDEX	HOURS
1	7.79	4.48	2.44	6.34	3.69	2.01	1.07	0.62	0.34	1.73	1.01	0.55
2	1.35	0.79	0.43	19.38	11.28	6.13	0.20	0.12	0.06	4.12	2.40	1.30
3	51.73	30.16	16.39	19.10	11.13	6.05	7.36	4.29	2.33	4.25	2.48	1.35
4	3.07	1.79	0.97	7.94	4.63	2.51	0.09	0.05	0.03	1.53	0.89	0.48
5	52.91	30.82	16.74	53.41	31.11	16.90	1.61	0.94	0.51	14.91	8.69	4.72
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	5.32	3.10	1.68	40.49	23.58	12.81	0.91	0.53	0.29	7.99	4.66	2.53
9	41.71	24.29	13.20	28.30	16.49	8.96	5.56	3.24	1.75	6.58	3.83	2.08
10	199.39	113.49	32.91	332.04	206.67	57.40	52.13	32.36	8.99	196.76	122.14	33.92
11	100.96	66.86	25.62	187.37	124.09	47.56	23.68	15.68	6.01	62.46	41.36	15.85
12	81.17	47.89	14.47	229.42	135.35	40.90	5.93	3.50	1.06	56.15	33.13	10.01
13	22.71	15.51	5.07	121.07	79.18	25.87	11.59	7.58	2.48	81.47	53.28	17.41
14	56.74	34.29	8.70	325.48	196.66	49.92	15.69	9.60	2.44	216.99	131.11	33.28
15	175.64	89.23	19.91	129.11	89.41	19.95	49.37	34.19	7.63	99.52	62.69	13.99
16	35.89	23.78	5.66	129.88	77.82	18.53	10.91	6.54	1.56	12.13	7.27	1.73
17	261.27	161.93	32.71	28.10	16.18	3.27	212.19	122.16	24.67	5.85	3.37	0.68
18	159.12	124.42	34.57	152.47	99.78	27.72	73.86	48.34	13.43	85.20	55.76	15.49
19	6.70	4.66	1.72	78.75	54.72	20.19	2.10	1.46	0.54	14.58	10.13	3.74
20	189.61	116.96	29.91	90.59	56.06	14.33	75.76	46.88	11.99	65.14	40.31	10.31
21	137.35	78.04	16.75	188.68	107.20	23.01	128.40	72.95	15.66	58.55	33.27	7.14
22	311.60	196.10	49.15	266.22	167.54	41.99	207.29	130.45	32.70	207.25	130.43	32.69
23	741.67	468.52	109.71	276.13	174.44	40.85	403.58	254.95	59.70	179.55	113.42	26.56
24	334.63	147.66	40.25	503.76	317.03	86.41	100.56	63.28	17.25	421.69	265.38	72.33
25	302.74	121.26	25.63	123.51	73.87	15.61	116.81	69.86	14.77	118.87	71.10	15.03
26	77.57	51.44	16.54	161.29	106.90	34.37	59.79	39.65	12.75	96.79	64.18	20.64
27	57.95	32.94	6.06	17.34	9.96	1.86	45.35	25.31	4.74	17.04	9.96	1.86
28	439.87	243.14	54.52	27.88	15.44	3.46	46.29	25.64	5.75	4.90	2.72	0.61
29	17.03	10.65	2.70	37.82	23.68	5.99	3.07	1.92	0.49	4.76	2.98	0.75
30	1434.65	1145.65	189.00	1044.23	731.76	120.72	536.12	375.70	61.98	693.63	489.58	80.77
31	86.24	53.63	11.13	147.90	91.98	19.08	39.77	24.73	5.13	58.73	36.52	7.58
32	408.55	256.37	52.72	268.65	167.08	34.67	102.35	63.65	13.21	143.87	89.47	18.56
33	0.0	0.0	0.0	2.00	1.24	0.26	0.0	0.0	0.0	2.00	1.24	0.26
34	252.25	215.06	45.45	52.60	32.71	6.79	66.28	41.22	8.55	46.02	28.62	5.94
35	2312.16	1493.69	496.17	1437.21	931.44	308.41	797.61	516.92	171.16	798.58	517.55	171.37
36	1004.51	707.40	205.00	582.64	410.31	118.91	325.11	228.95	66.35	380.44	267.92	77.64
37	192.22	111.59	26.22	223.12	129.64	30.44	70.33	40.87	9.60	170.24	98.92	23.23
38	116.25	67.16	13.91	150.76	95.30	19.73	43.12	27.25	5.64	84.39	53.34	11.05
39	3054.68	1905.42	843.67	1700.31	1061.37	469.70	1104.57	689.49	305.13	974.22	608.13	269.12
40	3065.97	2102.86	698.40	1601.64	1098.52	364.84	881.85	604.83	200.88	632.69	433.95	144.12

Remark: See Table 23 (p. 241) for the 40 sector industrial classification.

TABLE 22 (continued)

ESTIMATED EMPLOYMENT STATISTICS

FOR YEAR 1978

	OK NONWATER			ARK NONWATER			REST U.S.A.			U.S.A.		
	WAGE	LINDEX	HOURS	WAGE	LINDEX	HOURS	WAGE	LINDEX	HOURS	WAGE	LINDEX	HOURS
1	6.63	3.86	2.10	4.61	2.68	1.46	1080.97	629.57	342.09	1095.00	637.74	346.52
2	1.15	0.67	0.36	15.26	8.89	4.83	173.55	101.31	55.05	194.68	113.30	61.61
3	44.42	25.87	14.06	14.85	8.65	4.70	1717.35	1000.21	543.47	1786.23	1041.49	566.90
4	2.99	1.74	0.95	6.42	3.74	2.03	139.31	81.14	44.09	150.33	87.55	47.57
5	51.30	29.88	15.23	38.49	22.42	12.18	2319.85	1351.10	734.13	2426.16	1413.03	767.77
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	4.40	2.57	1.39	32.50	18.93	10.29	915.42	533.15	289.69	961.23	559.83	304.19
9	36.15	21.05	11.44	21.73	12.65	6.88	13720.57	7991.01	4341.95	13790.59	8031.79	4364.11
10	138.76	86.14	23.92	136.18	84.53	23.48	28306.25	17620.27	4894.18	28910.09	17945.43	4994.58
11	77.28	51.18	19.61	124.92	82.73	31.70	21978.31	14555.17	5579.25	22266.65	14746.12	5651.43
12	75.24	44.39	13.41	173.27	102.22	30.89	10369.25	6117.55	1848.35	10679.64	6300.79	1903.71
13	12.12	7.03	2.59	39.60	25.90	8.46	5409.14	3537.70	1155.80	5553.91	3632.38	1186.73
14	40.66	24.69	6.27	108.49	65.55	16.64	12847.24	7762.68	1970.44	13229.48	7993.63	2029.06
15	79.48	55.04	12.28	38.58	25.72	5.96	17837.07	12387.17	2764.62	18145.02	12565.80	2804.49
16	28.78	17.25	4.11	117.76	70.55	16.80	21388.06	13114.47	3122.40	22057.64	13216.08	3146.60
17	69.08	39.77	8.03	22.24	12.31	2.59	6111.60	3518.48	710.65	6420.97	3696.59	745.52
18	115.26	75.09	21.14	67.26	44.02	12.23	11618.42	7603.68	2112.44	11961.00	7827.88	2174.73
19	4.61	3.20	1.18	64.17	44.59	16.45	2346.98	1630.98	601.79	2432.43	1690.36	623.70
20	113.25	70.08	17.92	25.45	15.75	4.03	11650.11	7209.23	1843.37	11929.71	7382.25	1887.61
21	8.95	5.09	1.09	130.12	73.93	15.87	20492.79	16189.08	3474.73	20818.81	16374.33	3514.49
22	104.31	65.64	16.45	58.97	37.11	9.30	27855.30	17530.08	4393.58	28433.12	17893.72	4484.72
23	338.09	213.58	50.01	96.58	61.01	14.29	44050.96	27827.52	6516.41	45068.76	28470.48	6668.98
24	134.03	84.38	23.09	82.07	51.65	14.09	34016.96	21407.78	5834.81	34755.35	21872.45	5961.47
25	85.93	51.39	10.86	4.64	2.77	0.59	41167.75	24621.86	5204.52	41464.00	24816.98	5249.76
26	17.78	11.79	3.79	64.42	42.72	13.73	22832.34	15140.81	4868.50	23071.11	15299.15	4919.21
27	12.60	7.03	1.32	0.0	0.0	0.0	7048.34	3933.23	736.50	7124.14	3975.52	744.42
28	392.58	217.49	48.77	22.97	12.73	2.85	7176.48	3975.89	891.49	7643.22	4234.47	949.47
29	13.97	8.74	2.21	33.06	20.70	5.24	4095.76	2564.66	649.09	4150.61	2599.01	657.78
30	1098.72	769.95	127.02	345.59	242.18	39.95	122163.64	85608.72	14122.96	124842.71	87486.13	14427.68
31	46.47	28.90	6.00	89.18	55.46	11.51	9877.62	6142.80	1274.53	10111.77	6288.41	1304.74
32	304.19	190.42	39.51	124.79	77.61	16.10	26962.43	16767.68	3479.02	27639.64	17188.83	3566.41
33	0.0	0.0	0.0	0.0	0.0	0.0	3150.95	1959.55	406.57	3152.96	1960.79	406.83
34	285.97	177.84	36.90	5.57	4.09	0.95	16703.70	10390.98	2155.96	17113.53	10642.75	2208.20
35	1514.55	981.56	325.01	638.63	413.89	137.04	189735.96	122965.63	40715.57	193435.33	125395.54	41520.46
36	679.40	478.45	138.65	202.20	142.39	41.26	90872.73	63994.88	18545.46	92459.88	65112.59	18869.36
37	121.99	79.82	16.63	52.87	30.72	7.21	28490.44	16554.58	3886.83	28905.77	16795.91	3943.46
38	63.13	39.90	8.25	66.37	41.95	8.59	13024.46	8232.91	1704.77	13281.45	8395.36	1733.41
39	1949.51	1216.92	538.54	726.09	453.24	200.59	287399.11	179400.19	79392.02	292153.50	182367.98	80795.39
40	2184.13	1498.03	497.52	968.95	664.58	220.72	229460.00	157385.46	52270.62	234135.62	160586.98	53333.95

Remark: See Table 23 (p. 241) for the 40 sector industrial classification.

TABLE 23

The 40 Sector Industrial Classification

40 Sector Code	35 Sector Code	Industrial Classification
1	1	Dairy farm products
2	2	Poultry and eggs
3	3	Meat animals and products
4	4	Cotton
5	5	Food and feed grains
6	7	Fruits and nuts
7	7	Vegetables and melons
8	6	Oil bearing crops
9	7	Misc. agricultural products, forestry and fishery
10	8	Food and kindred products
11	9	Apparel and textile products
12	10	Lumber and wood products
13	11	Furniture and fixtures
14	12	Paper and allied products
15	13	Printing and publishing
16	14	Chemical and allied products
17	15	Petroleum and allied products
18	16	Rubber
29	17	Leather
20	18	Stone, clay and glass products
21	19	Primary metal products
22	20	Fabricated metal
23	21	Machinery except electrical
24	22	Electrical equipment
25	23	Motor vehicle & transp. equip.
26	24	Misc. manufacturing
27	25	Bituminous coal
28	26	Crude petroleum & natural gas
29	27	Other mining except petroleum, gas and coal
30	28	Contract construction
31	29	Railroads and related service
32	29	Motor freight transportation
33	29	Water transportation
34	29	Other transportation
35	30	Wholesale and retail trade
36	31	Finance, insurance & real estate
37	32	Communications, radio & TV broadcasting
38	33	Electric, gas & sanitary services
39	34	Hotel and other services
40	35	Government

APPENDIX III

COMPUTER ALGORITHMS

APPENDIX III: COMPUTER ALGORITHMS

*Programs needed to solve the linear transportation algorithms.

```
      SUBROUTINE DBLOCK(A,C,N,M,NU)
      REAL*8 A(1),C(1)
      NN=N*N
      DO 20 J=1,M
      DO 20 I=1,M
      L=I+(J-1)*M
      CALL NULL(A,N)
      DO 21 JJ=1,N
      DO 21 II=1,N
      LL=II+(I-1)*N+(J-1)*N*M
      LK=II+(JJ-1)*N
      IF(II .EQ. JJ) A(LK)=C(LL)
21    CONTINUE
      WRITE(NU'L) (A(KK),KK=1,NN)
20    CONTINUE
      RETURN
      END
```

```
      SUBROUTINE DCOMPJ(A,B,C,NS,J,N,M,N1)
      REAL*8 A(1),B(1),C(1)
      NN=N*N
      CALL NULL(B,N)
      DO 10 I=1,M
      LL=I+(J-1)*M
      FIND(N1'LL)
      READ(N1'LL)  (A(KK),KK=1,NN)
      DO 10 JJ=1,N
      DO 10 II=1,N
      LJ=II+(JJ-1)*N
10    B(LJ)=B(LJ)+A(LJ)
C     COMPUTE THE TRADE COEFFICIENTS
      DO 11 I=1,M
      LL=I+(J-1)*M
      FIND(N1'LL)
      READ(N1'LL)  (A(KK),KK=1,NN)
      DO 11 II=1,N
      C(NS)=0.0
      NCT=N
      DO 12 JJ=1,N
      LJ=II+(JJ-1)*N
      IF(A(LJ).EQ.0.0)  NCT=NCT-1
      IF((A(LJ)  .EQ.  0.)  .OR.  (B(LJ)  .EQ.  0.))  GO TO 12
      C(NS)=C(NS)+A(LJ)/B(LJ)
12    CONTINUE
      IF(NCT.LE.0)  NCT=1
      C(NS)=C(NS)/NCT
      NS=NS+1
11    CONTINUE
      RETURN
      END
```

```
      SUBROUTINE DECOMP(A,B,C,N,M,N1,N2)
      REAL*8 A(1),B(1),C(1)
      NN=N*N
      DO 10 J=1,M
      NS=1+(J-1)*N*M
      CALL DCOMPJ(A,B,C,NS,J,N,M,N1)
      WRITE(6,100) J
      CALL PRINT(B,'B        ',N,N)
      WRITE(N2'J) (B(KK),KK=1,NN)
10    CONTINUE
      CALL PTRADE(C,N,M)
100   FORMAT(1H0,10X,'REGION  ',I5,/)
      RETURN
      END
```

```
C
      DO 65 I=1,N
      IK=NK+I
      HOLD=A(IK)
      IJ=I-N
      DO 65 J=1,N
      IJ=IJ+N
      IF(I-K) 60,65,60
   60 IF(J-K) 62,65,62
   62 KJ=IJ-I+K
      A(IJ)=HOLD*A(KJ)+A(IJ)
   65 CONTINUE
C
C        DIVIDE ROW BY PIVOT
C
      KJ=K-N
      DO 75 J=1,N
      KJ=KJ+N
      IF(J-K) 70,75,70
   70 A(KJ)=A(KJ)/BIGA
   75 CONTINUE
C
C        PRODUCT OF PIVOTS
C
      D=D*BIGA
C
C        REPLACE PIVOT BY RECIPROCAL
C
      A(KK)=1.0/BIGA
   80 CONTINUE
C
C        FINAL ROW AND COLUMN INTERCHANGE
C
      K=N
  100 K=(K-1)
      IF(K) 150,150,105
  105 I=L(K)
      IF(I-K) 120,120,108
  108 JQ=N*(K-1)
      JR=N*(I-1)
      DO 110 J=1,N
      JK=JQ+J
      HOLD=A(JK)
      JI=JR+J
      A(JK)=-A(JI)
  110 A(JI) =HOLD
  120 J=M(K)
      IF(J-K) 100,100,125
  125 KI=K-N
      DO 130 I=1,N
      KI=KI+N
      HOLD=A(KI)
      JI=KI-K+J
      A(KI)=-A(JI)
  130 A(JI) =HOLD
      GO TO 100
  150 RETURN
      END
```

```
C
      DO 65 I=1,N
      IK=NK+I
      HOLD=A(IK)
      IJ=I-N
      DO 65 J=1,N
      IJ=IJ+N
      IF(I-K) 60,65,60
   60 IF(J-K) 62,65,62
   62 KJ=IJ-I+K
      A(IJ)=HOLD*A(KJ)+A(IJ)
   65 CONTINUE
C
C        DIVIDE ROW BY PIVOT
C
      KJ=K-N
      DO 75 J=1,N
      KJ=KJ+N
      IF(J-K) 70,75,70
   70 A(KJ)=A(KJ)/BIGA
   75 CONTINUE
C
C        PRODUCT OF PIVOTS
C
      D=D*BIGA
C
C        REPLACE PIVOT BY RECIPROCAL
C
      A(KK)=1.0/BIGA
   80 CONTINUE
C
C        FINAL ROW AND COLUMN INTERCHANGE
C
      K=N
  100 K=(K-1)
      IF(K) 150,150,105
  105 I=L(K)
      IF(I-K) 120,120,108
  108 JQ=N*(K-1)
      JR=N*(I-1)
      DO 110 J=1,N
      JK=JQ+J
      HOLD=A(JK)
      JI=JR+J
      A(JK)=-A(JI)
  110 A(JI) =HOLD
  120 J=M(K)
      IF(J-K) 100,100,125
  125 KI=K-N
      DO 130 I=1,N
      KI=KI+N
      HOLD=A(KI)
      JI=KI-K+J
      A(KI)=-A(JI)
  130 A(JI) =HOLD
      GO TO 100
  150 RETURN
      END
```

```
      SUBROUTINE IMINUS(A,B,T,N,M,N1,N2,MODE)
C     SUBROUTINE IMINUS CALCULATE (I-S)
C     IF MODE=0  (I-S)*(I-T HEAD)INVERSE
C     IF MODE=1  (I-S)'*(I-THEAD)INVERSE
C     IF(I-S) IS DESIRED, SET THEAD=0 AND MODE=0.
      REAL*8 A(1),T(1),B(1),TEMP
      NN=N*N
      DO 180 J=1,M
      DO 180 I=1,M
      L=I+(J-1)*M
      FIND(N1'L)
      READ(N1'L)  (A(KK),KK=1,NN)
      DO 182 JJ=1,N
      JL=JJ+(J-1)*N
      DO 182 II=1,N
      LL=II+(JJ-1)*N
      IF((I.EQ.J) .AND. (II.EQ.JJ)) GO TO 181
      B(LL)=-A(LL)/(1.-T(JL))
      GO TO 182
181   B(LL)=1.-(A(LL)/(1.-T(JL)))
182   CONTINUE
      IF(MODE.EQ.0) GO TO 200
C     TRANSPOSE B
      DO 183 KI=1,N
      DO 183 KJ=KI,N
      KIKJ=KJ+(KI-1)*N
      KJKI=KI+(KJ-1)*N
      TEMP=B(KIKJ)
      B(KIKJ)=B(KJKI)
183   B(KJKI)=TEMP
C     TRANSPOSE THE BLOCKS
      IF(MODE .NE. 0.)  L=J+(I-1)*M
200   WRITE(N2'L)  (B(KK),KK=1,NN)
180   CONTINUE
      RETURN
      END
```

```
      SUBROUTINE INITIA
C SOBROUTINE INITIA WHICH FINDS THE INITIAL A.C. SOLN
      COMMON /DUAL/ G(25),H(25)
      COMMON/LPSA/AM(25,25),Q(25)
      COMMON/QPDATA/B(25,25),A(25),MBASIS(50), L1,NL1,NL2,NE1,NE2,IR,M1
      COMMON /DATA/ N,M,KODE
C
C     SET UP BASE
C
      DO 5 I=1,N
      DO 5 J=1,N
      B(I,J)=0.0
      B(I,I)=1.0
5     CONTINUE
      I=1
      J=2
    9 IF(Q(I) .LE. Q(J))GO TO 18
      I=J
   18 J=J+1
      IF(J .LE. N)GO TO 9
      IR=I
      T1=-Q(IR)
      IF (T1 .GT. 0.0) GO TO 19
 1000 FORMAT(1H0,'INITIAL Q-VECTOR IS NON-NEGATIVE.  W = Q, Z = 0 IS OPT
     1IMAL.')
      DO 123 I=1,N
      G(I)=Q(I)
123   H(I)=0.0
      M=1
      RETURN
C
   19 DO 10 I=1,N
      Q(I)=Q(I)+T1
   10 CONTINUE
      Q(IR)=T1
      K=0
      DO 12 J=1,N
      B(J,IR)=-1.0
      MBASIS(J)=1
      L=N+J
      K=K+1
      MBASIS(L)=K
   12 CONTINUE
      NL1=1
      L=N+IR
      NL2=IR
      MBASIS(IR)=3
      MBASIS(L)=0
      Z0=Q(IR)
      M1=IR
      L1=1
      RETURN
      END
```

```
      SUBROUTINE  LEMKE(XA,DS,K)
      DIMENSION XA(1),DS(1)
      COMMON/LPSA/AM(25,25),Q(25)
      COMMON/QPDATA/B(25,25),A(25),MBASIS(50), L1,NL1,NL2,NE1,NE2,IR,M1
      COMMON /DATA/ N,M,KODE
      M=0
      N=K
      DO 100 I=1,N
100   Q(I)=DS(I)
      MCHOI=0
      DO 40 J=1,N
      DO 40 I=1,N
      MCHOI=MCHOI+1
40    AM(I,J)=XA(MCHOI)
C     READ M AND Q MATRIX
      CALL INITIA
      IF(M.EQ.1) GO TO 51
50    CALL NEWBAS
      IF(M .EQ. 1) GO TO 51
      CALL SORT
      IF(M .EQ. 1) GO TO 51
      CALL PIVOT
      GO TO 50
51    RETURN
      END
```

```
      SUBROUTINE LPRINT
C
C     PRINTS OUT CURRENT SOLUTIN.
      COMMON/DUAL/G(25),H(25)
      COMMON/QPDATA/B(25,25),A(25),MBASIS(50), L1,NL1,NL2,NE1,NE2,IR,M1
      COMMON/LPSA/AM(25,25),Q(25)
      COMMON /DATA/ N,M,KODE
      PRINT 1000
 1000 FORMAT(1H0,20X,'VARIABLE',10X,1HW,18X,1HZ,18X,2HZ0//)
C
      DO 100 J = 1,N
      DO 10 I = 1,N
      IF (MBASIS(I+N) .EQ. J) GO TO 20
   10 CONTINUE
      GO TO 90
   20 K2 = MBASIS(I)
      IF (K2 .EQ. 2) GO TO 40
30    G(J)=Q(I)
      H(J)=0.0
      PRINT 1010,J,Q(I)
1010  FORMAT(21X,I3,8X,G15.8)
      GO TO 100
40    H(J)=Q(I)
      G(J)=0.0
      PRINT 1020,J,Q(I)
1020  FORMAT(21X,I3,27X,G15.8)
      GO TO 100
C
   90 IF (NL1 .LT. 3) GO TO 50
      I = M1
      IF (NE1 .EQ. 1) GO TO 30
      GO TO 40
50    G(J)=0.0
      H(J)=0.0
      PRINT 1030,J,Q(M1)
1030  FORMAT(21X,I3,46X,G15.8)
100   CONTINUE
      PRINT 150,(G(I),H(I),I=1,N)
150   FORMAT(1H-,10X,'THIS IS A W VECTOR',10X,'THIS IS A Z VECTOR'/
     1 (10X,P15.8,14X,G15.8))
      RETURN
      END
```

```
      SUBROUTINE MAT(XO,R,C,NR,NC)
      REAL XO(NR,NC),R(1),C(1),XA(25,25),DS(25),TEMP(25,25),X1(625)
      K1=NR*NC
      K2=NR+NC
      K3=K1+K2
      DO 10 J=1,K3
      DO 10 I=1,K3
10    XA(I,J)=0.0
      DO 15 J=1,K1
      DO 15 I=1,K2
15    TEMP(I,J)=0.0
C
      DO 20 I=1,NR
      IT=I
      DO 20 J=1,NC
      TEMP(I,IT)=-1.0
20    IT=IT+NR
C
      JJ=0
      DO 30 I=1,NC
      II=I+NR
      DO 30 J=1,NR
      JJ=JJ+1
30    TEMP(II,JJ)=1.0
C
C     GENERATE XA MATRIX FOR REMKE
C
      DO 40 I=1,K2
      DO 40 J=1,K1
40    XA(I+K1,J)=TEMP(I,J)
      DO 50 J=1,K1
      DO 50 I=1,K2
50    XA(J,I+K1)=-TEMP(I,J)
      KT=0
      DO 80 J=1,NC
      DO 80 I=1,NR
      KT=KT+1
80    DS(KT)=XO(I,J)
      KT=K1
      DO 60 I=1,NR
60    DS(KT+I)=R(I)
      KT=K1+NR
      DO 70 J=1,NC
70    DS(KT+J)=-C(J)
      IU=0
      DO 18 J=1,K3
      DO 18 I=1,K3
      IU=IU+1
18    X1(IU)=XA(I,J)
      CALL LEMKE(X1,DS,K3)
      RETURN
      END
```

```
      SUBROUTINE MULT(A,B,C,N,M,NU1,NU2,NU3)
      REAL*8 A(1),B(1),C(1)
C
C     SUBROUTINE MULT COMPUTES THE PARTITIONED MULTIPLICATION  A*B = C
C
      NN=N*N
      DO 12 K=1,M
      DO 12 J=1,M
      NC=J+(K-1)*M
      CALL NULL(C,N)
      DO 11 I=1,M
      LB=I+(K-1)*M
      LA=J+(I-1)*M
      READ(NU1'LA) (A(KK),KK=1,NN)
      READ(NU2'LB) (B(KK),KK=1,NN)
      DO 11 JJ=1,N
      DO 11 II=1,N
      DO 11 KK=1,N
      LC=II+(JJ-1)*N
      KA=II+(KK-1)*N
      KB=KK+(JJ-1)*N
11    C(LC)=C(LC)+A(KA)*B(KB)
12    WRITE(NU3'NC) (C(KK),KK=1,NN)
      RETURN
      END
```

```
      SUBROUTINE MULTCO(B,C,D,A,N,M,N1,N2)
      REAL*8 A(1),B(1),C(1),D(1)
      NN=N*N
      DO 10 J=1,M
      DO 10 I=1,M
      L=I+(J-1)*M
      READ(N1'L)  (B(KK),KK=1,NN)
      DO 11 JJ=1,N
      DO 11 II=1,N
      LL=II+(JJ-1)*N
      LRJ=JJ+(J-1)*N
      LSRI=II+(I-1)*N+(J-1)*N*M
      LSI=II+(I-1)*N
      A(LL)=D(LRJ)-C(LSRI)-D(LSI)
      A(LL)=B(LL)*DEXP(A(LL))
11    CONTINUE
      WRITE(N2'L)  (A(KK),KK=1,NN)
10    CONTINUE
      RETURN
      END
```

```
      SUBROUTINE NEWBAS
      COMMON/LPSA/AM(25,25),Q(25)
      COMMON/QPDATA/B(25,25),A(25),MBASIS(50), L1,NL1,NL2,NE1,NE2,IR,M1
      COMMON /DATA/ N,M,KODE
      IF((NL1 .LT. 3) .AND. (Q(M1) .GT. 1.E-12)) GO TO 20
      L1 = L1 -1
 1000 FORMAT(1H1,'ITERATION NUMBER ',I4,'.  COMPLEMENTARY SOLUTION.')
      CALL       LPRINT
      M=1
      RETURN
C
   20 NE1 = 3 - NL1
      NE2 = NL2
      IF (NL1 .GT. 1) GO TO 21
C
   27 DO 26 I=1,N
      T1=0.0
      DO 28 J=1,N
   28 T1 = T1 - B(I,J) * AM(J,NE2)
      A(I)=T1
   26 CONTINUE
      RETURN
   21 DO 29 I = 1,N
   29 A(I) = B(I,NE2)
      RETURN
      END
```

```
      SUBROUTINE NULL(D,N)
      REAL*8 D(1)
      NN=N*N
      DO 10 I=1,NN
10    D(I)=0.0
      RETURN
      END
```

```
      SUBROUTINE PATINV(A,B,C,D,N,M,U1,U2,U3,LX,MX)
      REAL*8 A(1),B(1),C(1),D(1),DD
      INTEGER U1,U2,U3,G,H,R,LX(1),MX(1)
      MM=M-1
      NN=N*N
      FIND(U1'1)
      READ(U1'1)  (A(KK),KK=1,NN)
      CALL DMINV(A,N,DD,LX,MX)
      WRITE(U2'1)  (A(KK),KK=1,NN)
      DO 200 R=1,MM
      DO 30 G=1,R
      CALL NULL(D,N)
      DO 30 H=1,R
      FIND(U2'(G+M*(H-1)))
      READ(U2'(G+M*(H-1)))  (A(KK),KK=1,NN)
      FIND(U1'(R*M+H))
      READ(U1'(R*M+H))  (B(KK),KK=1,NN)
      DO 10 I=1,N
      DO 10 J=1,N
      IJ=I+(J-1)*N
      DO 10 L=1,N
      IL=I+(L-1)*N
      LJ=L+(J-1)*N
   10 D(IJ)=D(IJ)+A(IL)*B(LJ)
   30 WRITE(U3'G)  (D(KK),KK=1,NN)
C
C     COMPUTE(D-CA(-1)B)
C
      CALL NULL(A,N)
      DO 40 G=1,R
      FIND(U1'(M*(G-1)+R+1))
      READ(U1'(M*(G-1)+R+1))  (C(KK),KK=1,NN)
      FIND(U3'G)
      READ(U3'G)  (D(KK),KK=1,NN)
C
C     MULTIPLY AND ACCUMULATE
C
      DO 40 J=1,N
      DO 40 I=1,N
      IJ=I+(J-1)*N
      DO 40 L=1,N
      IL=I+(L-1)*N
      LJ=L+(J-1)*N
   40 A(IJ)=A(IJ)+C(IL)*D(LJ)
C
C     OBTAIN H=(D-C*A(-1)*B)(-1)
C
      FIND(U1'((M+1)*R+1))
      READ(U1'((M+1)*R+1))  (D(KK),KK=1,NN)
      DO 70 J=1,N
      DO 70 I=1,N
      IJ=I+(J-1)*N
   70 D(IJ)=D(IJ)-A(IJ)
      CALL DMINV(D,N,DD,LX,MX)
      WRITE(U2'((M+1)*R+1))  (D(KK),KK=1,NN)
C     OBTAIN P=-A(-1)*B*H
C
      FIND(U3'1)
```

```
      DO 100 G=1,R
      READ(U3'G)  (B(KK),KK=1,NN)
      DO 90 J=1,N
      DO 90 I=1,N
      IJ=I+(J-1)*N
      C(IJ)=0.0
      DO 90 L=1,N
      IL=I+(L-1)*N
      LJ=L+(J-1)*N
   90 C(IJ)=C(IJ)-B(IL)*D(LJ)
  100 WRITE(U2'(R*M+G))  (C(KK),KK=1,NN)
C
C     OBTAIN C*A(-1)
C
      DO 120 G=1,R
      CALL NULL(D,N)
      DO 110 H=1,R
      FIND(U2'(H+M*(G-1)))
      READ(U2'(H+M*(G-1)))  (A(KK),KK=1,NN)
      FIND(U1'(1+R+M*(H-1)))
      READ(U1'(1+R+M*(H-1)))  (C(KK),KK=1,NN)
      DO 110 I=1,N
      DO 110 J=1,N
      IJ=I+(J-1)*N
      DO 110 L=1,N
      IL=I+(L-1)*N
      LJ=L+(J-1)*N
  110 D(IJ)=D(IJ)+C(IL)*A(LJ)
  120 WRITE(U3'(MM+G))  (D(KK),KK=1,NN)
C
C     COMPUTE G=-HCA(-1)
C     AND STORE
C
      FIND(U2'((M+1)*R+1))
      READ(U2'((M+1)*R+1))  (B(KK),KK=1,NN)
      DO 141 G=1,R
      CALL NULL(A,N)
      FIND(U3'(MM+G))
      READ(U3'(MM+G))  (C(KK),KK=1,NN)
      DO 140 J=1,N
      DO 140 I=1,N
      IJ=I+(J-1)*N
      DO 140 L=1,N
      IL=I+(L-1)*N
      LJ=L+(J-1)*N
  140 A(IJ)=A(IJ)-B(IL)*C(LJ)
  141 WRITE(U2'(1+R+M*(G-1)))  (A(KK),KK=1,NN)
C
C     COMPUTE A(-1)B*G
C
      DO 180 G=1,R
      FIND(U2'(1+R+M*(G-1)))
      READ(U2'(1+R+M*(G-1)))  (A(KK),KK=1,NN)
      DO 180 H=1,R
      FIND(U3'H)
      READ(U3'H)  (B(KK),KK=1,NN)
      FIND(U2'(H+M*(G-1)))
      READ(U2'(H+M*(G-1)))  (C(KK),KK=1,NN)
```

```
C
C       COMPUTE E=A(-1)-A(-1)BG
C
        DO 160 J=1,N
        DO 160 I=1,N
        IJ=I+(J-1)*N
        D(IJ)=0.0
        DO 160 L=1,N
        IL=I+(L-1)*N
        LJ=L+(J-1)*N
  160   D(IJ)=D(IJ)+B(IL)*A(LJ)
        DO 161 J=1,N
        DO 161 I=1,N
        IJ=I+(J-1)*N
  161   C(IJ)=C(IJ)-D(IJ)
  180   WRITE(U2'(H+M*(G-1)))  (C(KK),KK=1,NN)
C
C       END OF ROUND
C
  200   WRITE(6,1000) R
 1000   FORMAT(10X,'ROUND',I4,' IS OVER')
        RETURN
        END
```

```
      SUBROUTINE PCHNGE(A,B,DP,N,M,U1)
      INTEGER U1
      REAL*8 A(1),B(1),DP(1)
      LCK=0
      GO TO 20
      ENTRY ATB(A,B,DP,N,M,U1)
      LCK=1
20    CONTINUE
      NM=N*M
      NN=N*N
      DO 9 KK=1,NM
9     DP(KK)=0.0
      IF(LCK .EQ. 1) GO TO 21
      DO 10 I=1,M
      DO 10 J=1,M
      L=I+(J-1)*M
      FIND(U1'L)
      READ(U1'L)  (A(K),K=1,NN)
      LK1=1+(J-1)*N
      DO 11 II=1,N
      KK=II+(I-1)*N
      DO 11 JJ=1,N
      LL=II+(JJ-1)*N
      LK=LK1+JJ-1
11    DP(KK)=DP(KK)+A(LL)*B(LK)
10    CONTINUE
      RETURN
21    CONTINUE
      DO 22 J=1,M
      DO 22 I=1,M
      L=I+(J-1)*M
      READ(U1'L) (A(K),K=1,NN)
      LK1=1+(J-1)*N
      DO 23 JJ=1,N
      KK=JJ+(J-1)*N
      DO 23 II=1,N
      LL=II+(JJ-1)*N
      LK=LK1+II-1
23    DP(KK)=DP(KK)+A(LL)*B(LK)
22    CONTINUE
      RETURN
      END
```

```
      SUBROUTINE PIVOT
      COMMON/LPSA/AM(25,25),Q(25)
      COMMON/QPDATA/B(25,25),A(25),MBASIS(50), L1,NL1,NL2,NE1,NE2,IR,M1
      COMMON /DATA/ N,M,KODE
      DO 30 I=1,N
   30 B(IR,I)=B(IR,I)/A(IR)
      Q(IR)=Q(IR)/A(IR)
      DO 31 I = 1,N
      IF (I .EQ. IR)GO TO 31
      Q(I) = Q(I) - Q(IR) * A(I)
      DO 32 J = 1,N
      B(I,J) = B(I,J) - B(IR,J) * A(I)
   32 CONTINUE
   31 CONTINUE
   33 NL1=MBASIS(IR)
      L=N+IR
      NL2=MBASIS(L)
      MBASIS(IR)=NE1
      MBASIS(L)=NE2
      L1=L1+1
      RETURN
      END
```

```
      SUBROUTINE PPRINT(A,B,N,M,N1)
      REAL*8 A(1),B
      NN=N*N
      DO 10 J=1,M
      DO 10 I=1,M
      L=I+(J-1)*M
      READ(N1'L)  (A(KK),KK=1,NN)
   10 CALL PRINT(A,B,N,N)
      RETURN
      ENTRY SPRINT(A,B,N,M,N1)
      NN=N*N
      DO 11 J=1,M
      READ(N1'J)  (A(KK),KK=1,NN)
11    CALL PRINT(A,B,N,N)
      RETURN
      END
```

```
      SUBROUTINE PRINT(X,A,NR,NC)
      REAL*8 X(1),A
      WRITE(6,101) A
101   FORMAT(/,10X,A8,/)
      KK=0
      N=1
      NJ1=NC
      NN=10
33    CONTINUE
      IF(NN.GT.NJ1) NF=10-NN+NJ1
      IF(NN.GT.NJ1) KK=1
      IF(KK.EQ.1) NN=NJ1
      WRITE(6,114) (I,I=N,NN)
114   FORMAT(//,6X,10(8X,I4),/)
      NRNN=NR*NN
      DO 43 I=1,NR
      LB=I+NR*(NN-10)
      IF(KK.EQ.1) LB=I+NR*(NN-NF)
43    WRITE(6,115) I,(X(J),J=LB,NRNN,NR)
115   FORMAT(5X,I4,5X,10G11.4)
      IF(NN.EQ.NC) GO TO 34
      N=N+10
      NN=NN+10
      GO TO 33
34    RETURN
      END
```

```
      SUBROUTINE PTRADE(C,N,M)
      REAL*8 C(1)
      NM=N*M
      DO 10 II=1,N
      WRITE(6,100) II
      WRITE(6,101) (J,J=1,M)
      DO 11 I=1,M
      LS=II+(I-1)*N
      LT=N*M*M
      LI=N*M
11    WRITE(6,102) I,(C(LL),LL=LS,LT,LI)
10    CONTINUE
100   FORMAT(1H0,20X,'INDUSTRY  ',I3,//)
101   FORMAT(13X,10(1X,I3,4X),/)
102   FORMAT(5X,I5,5X,10(F7.5,1X))
      RETURN
      END
```

```
      SUBROUTINE RAS(A,U,V,R,S,N1,N2,XA,T,IR,ERR)
      REAL*8 U(1),V(1),XA(1),A(1),R(1),S(1),T(1)
      INTEGER IR(1)
C
C     XA : INPUT BASE MATRIX
C     A : OUTPUT NEW MATRIX
C     U : COLUMN VECTOR
C     V : ROW VECTOR
C     N1: NUMBER OF ROW
C     N2: NUMBER OF COLUMN
C     T & IR ARE WORKING VECTORS
C     SIZE OF T & IR SHOULD BE MAX(N1,N2)
C
      N12=N1*N2
      DO 60 I=1,N12
60    A(I)=XA(I)
      DO 65 I=1,N1
65    R(I)=1.0
      DO 66 J=1,N2
66    S(J)=1.0
      KSTOP=0
   70 CONTINUE
      KSTOP=KSTOP+1
      IF(KSTOP-100)222,223,222
223   WRITE(6,1)
1     FORMAT('0','INFINITE LOOP**********************************'/)
      RETURN
222   DO 75 I=1,N1
75    IR(I)=0
      DO 80 I=1,N1
      T(I)=0.0
      DO 85 J=I,N12,N1
85    T(I)=T(I)+A(J)
      IF(T(I) .EQ. 0.0) GO TO 71
       T(I)=U(I)/T(I)
      R(I)=R(I)* T(I)
      IF(DABS(DABS( T(I))-1.0).LT. ERR ) IR(I)=1
      GO TO 80
   71  T(I)=1.0
      R(I)=1.0
      IR(I)=1
   80 CONTINUE
      KK=0
      DO 90 J=1,N2
      DO 90 I=1,N1
      KK=KK+1
90    A(KK)=T(I)*A(KK)
      DO 115 I=1,N1
      IF(IR(I).NE.1) GO TO 70
115   CONTINUE
C
      DO 76 J=1,N2
76    IR(J)=0
      NU=0
      DO 95 J=1,N2
      T(J)=0.0
      DO 100 I=1,N1
      NU=NU+1
```

```
100     T(J)=T(J)+A(NU)
        IF(T(J) .EQ. 0.0) GO TO 102
        T(J)=V(J)/T(J)
        S(J)=S(J)*T(J)
        IF(DABS(DABS( T(J))-1.0).LT. ERR ) IR(J)=1
        GO TO 95
  102   T(J)=1.0
        S(J)=1.0
        IR(J)=1
   95   CONTINUE
        DO 105 I=1,N1
        KK=I
        DO 105 J=1,N2
        A(KK)=A(KK)*T(J)
105     KK=KK+N1
        DO 110 J=1,N2
        IF(IR(J).NE.1) GO TO 70
  110   CONTINUE
        RETURN
        END
```

```
      SUBROUTINE SELAST(T,B,C,A,N,M,N1,N2)
      REAL*8 T(1),B(1),A(1),C(1)
      LCK=1
      GO TO 12
      ENTRY TA(T,B,A,N,M,N1,N2)
      LCK=0
12    CONTINUE
      NN=N*N
      DO 10 J=1,M
      READ(N1'J)  (B(KK),KK=1,NN)
      DO 10 I=1,M
      L=I+(J-1)*M
      DO 11 JJ=1,N
      JL=JJ+(J-1)*N
      DO 11 II=1,N
      LT=II+(I-1)*N+(J-1)*M*N
      LL=II+(JJ-1)*N
      A(LL)=T(LT)*B(LL)
      IF(LCK.EQ.1)  A(LL)=A(LL)/(1.-C(JL))
11    CONTINUE
      WRITE(N2'L)  (A(KK),KK=1,NN)
10    CONTINUE
      RETURN
      END
```

```
      SUBROUTINE SORT
      COMMON /NOSO/ NSOK
      COMMON/LPSA/AM(25,25),Q(25)
      COMMON/QPDATA/B(25,25),A(25),MBASIS(50), L1,NL1,NL2,NE1,NE2,IR,M1
      COMMON /DATA/ N,M,KODE
      COMMON /CHOI/ KKC
      DIMENSION IVAR(2)
      DATA IVAR/2HW(,2HZ(/
      I=1
   52 IF(A(I).GT.0.0)GO TO 51
      I=I+1
      IF(I.GT.N)GO TO 57
      GO TO 52
   51 T1=Q(I)/A(I)
      IR=I
   55 I=I+1
      IF(I.GT.N)GO TO 56
   53 IF(A(I).GT.0.0)GO TO 54
      GO TO 55
   54 T2=Q(I)/A(I)
      IF(T2.GE.T1)GO TO 55
      IR=I
      T1=T2
      GO TO 55
   56 IRTYP = MBASIS(IR)
      IF (IRTYP .GT. 2) GO TO 100
      K2 = MBASIS(IR+N)
  100 RETURN
57    CONTINUE
  250 FORMAT(1H0,'ITERATION NUMBER ',I4,'.  PROBLEM HAS NO COMPLEMENTARY
     1 SOLUTION.')
      M=1
      KKC=2
      NSOK=NSOK+1
      KODE=M
      RETURN
      END
```

```
      SUBROUTINE WLNC(W,C,Z,N,M,N1)
      REAL*8 W(1),C(1),Z(1)
      NN=N*N
      NM=N*M
      DO 9 I=1,NM
    9 Z(I)=0.0
      DO 10 J=1,M
      DO 10 I=1,M
      L=I+(J-1)*M
      FIND(N1'L)
      READ(N1'L)  (W(KK),KK=1,NN)
      DO 11 JJ=1,N
      LA=JJ+(J-1)*N
      DO 11 II=1,N
      LL=II+(JJ-1)*N
      LB=II+(I-1)*N+(J-1)*N*M
   11 Z(LA)=Z(LA)+W(LL)*C(LB)
   10 CONTINUE
      RETURN
      END
```

EXPLANATION OF SUBROUTINES

1. (a) Entry TA(T, B, A, N, M, N1, N2)

T = input variable t_i^{sr}

B = input variable a_{ij}^{r}

A = output variable a_{ij}^{sr}

N = input no. of industries.

M = input no. of regions.

N1 = input file of a_{ij}^{r}.

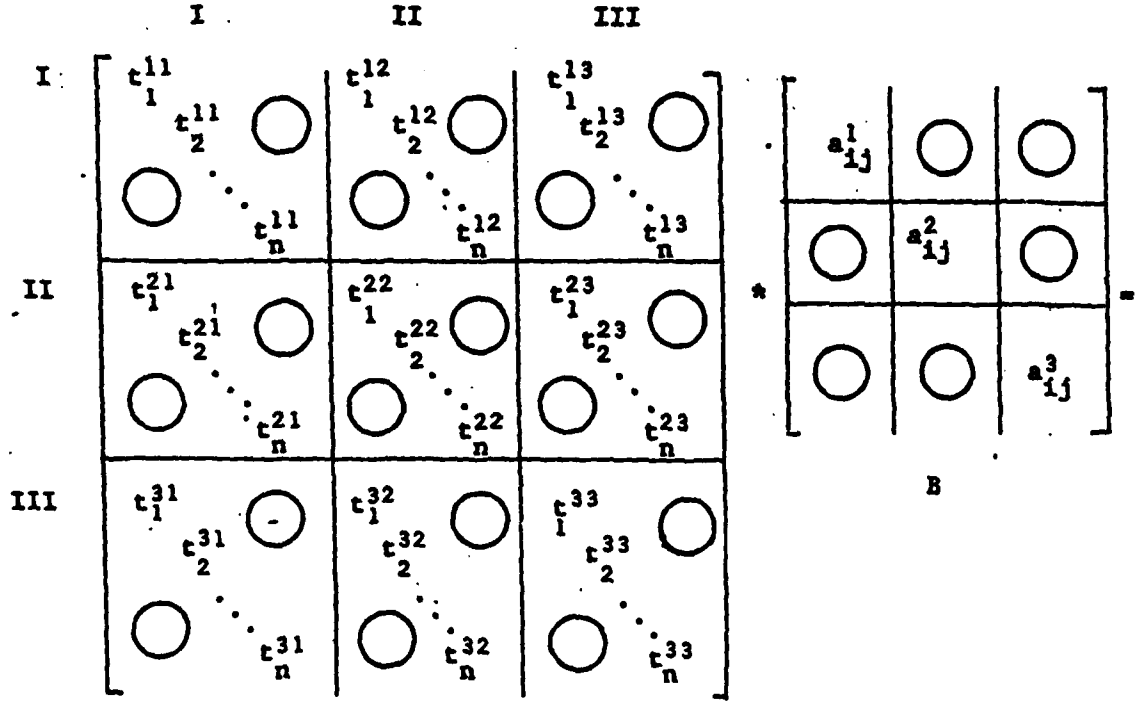
N2 = output file of a_{ij}^{sr}.

entry TA computes the multiregional coefficients A.

$$t_i^{sr} \cdot a_{ij}^{r} = a_{ij}^{sr}$$

$$T * B = A$$

T is a properly stacked trade coefficient matrix and B is a block diagonal regional coefficient matrix.



T

B

$$\left[\begin{array}{c|c|c} a_{ij}^{11} & a_{ij}^{12} & a_{ij}^{13} \\ \hline a_{ij}^{21} & a_{ij}^{22} & a_{ij}^{23} \\ \hline a_{ij}^{31} & a_{ij}^{32} & a_{ij}^{33} \end{array}\right]$$

A

(b) Subroutine SELAST (T, B, C, A, N, M, N1, N2)

input = T, B, C, N, M, N1

output = A, N2

Subroutine SELAST computes input elasticities after obtaining multiregional coefficients as entry TA.

$$\alpha_{ij}^{sr} = \frac{a_{ij}^{sr}}{1-t_j^r} \quad \text{where } t_j^r \text{ is tax rate.}$$

2. (a) Subroutine PTRADE (C, N, M)

Subroutine PTRADE prints out trade coefficients among regions of each commodity.

(b) Subroutine PRINT (X, A, NR, NC)

Subroutine PRINT prints out X values under name 'A' in matrix form with no. of rows = NR and no. of columns = NC.

(c) Subroutine PPRINT (A, B, N, M, N1)

Subroutine PPRINT reads all nine A's from file N1 and prints out all A's under name B with no. of rows = N and No. of columns = M.

entry SPRINT (A, B, N, M, N1)

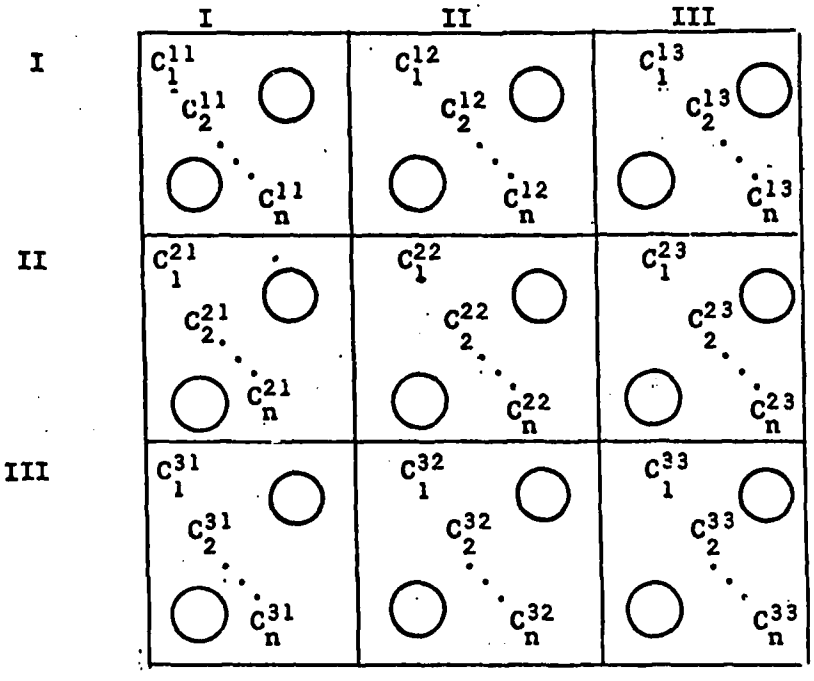
entry SPRINT reads 1st three A's from file N1 and prints out 1st three A's under name B with no. of rows = N and no. of columns = M.

(d) Subroutine DBLOCK (A, C, N, M, NU)

input = A, C, N, M

output = A, NU

Subroutine DBLOCK makes A matrices into N by N null matrices by calling Subroutine NULL (A, N) and makes each regional cell matrices into diagonal matrices whose elements come from C and writes them in file NU.



3. Subroutine IMINUS (A, B, T, N, M, N1, N2, MODE)

input = A, T, N, M, N1, MODE

output = B, N2

Subroutine IMINUS read A from file N1. It also reads tax T.

If mode = 0 Subroutine IMINUS computes $(I-S)=(I - \frac{a_{ij}^{sr}}{1-t_j^r})$

If mode = 1 Subroutine IMINUS computes (I-S)

If (I-A) is desired, set T=0, MODE = 0

where S is input elasticities a_{ij}^{sr} and A is multiregional coefficients.

4. (a) Subroutine PATINV (A, B, C, D, N. M. U1, U2, U3, LX, MX)

input = N, M, U1

output = U2

Utility = A, B, C, D, LX, MX, U3

Subroutine PATINV is the partitioned bordering inversion routine. This algorithm is necessary to invert the hugh interregional flow matrices, i.e. it can invert the multi-region, multi-industry variable input-output matrices. Efficient use of computer time and space is the key problem of multi-regional input-output study.

By using block-data system and decomposition of the inverting process, we call only the blocks which are required for computation (i.e., block-wise computation is feasible).

To invert 3 region 35 industry input-output matrices:

	I	II	III
I	M_{11}	M_{12}	M_{13}
II	M_{21}	M_{22}	M_{23}
III	M_{31}	M_{32}	M_{33}

where M_{ij} is 35 by 35 matrix.

(1) On 1st Iteration, we set

	I	II
I	A	B
II	C	D

$*$

E	F
G	H

$=$

I	0
0	I

where I is a 35 by 35 identity matrix.

$$\left[\begin{array}{c|c} A & B \\ \hline C & D \end{array}\right] = \begin{bmatrix} M_{11} & M_{12} \\ M_{21} & M_{22} \end{bmatrix}$$

We compute E, F, G, H as follows:

$$\begin{cases} H = (D - CA^{-1}B)^{-1} \\ F = -A^{-1}B \cdot H \\ G = -HCA^{-1} \\ E = A^{-1} - A^{-1}BG \end{cases}$$

(Ref: Goldberger, Econometric Theory, 1963, John Wiley & Sons, Inc.)

(2) On 2nd Iteration, we set

	III
III	$\left[\begin{array}{c\|c} A & B \\ \hline C & D \end{array}\right]$

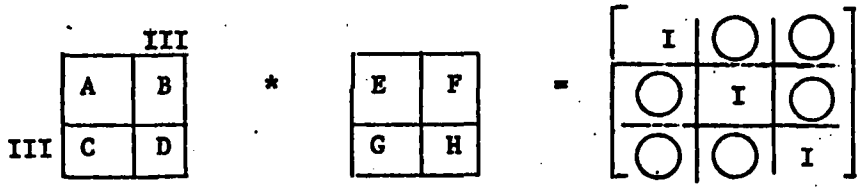
where $A = \left[\begin{array}{c|c} E & F \\ \hline G & H \end{array}\right]$

$$B = \left[\begin{array}{c} M_{13} \\ \hline M_{23} \end{array}\right]$$

$$C = \left[\begin{array}{c|c} M_{31} & M_{32} \end{array}\right]$$

$$D = \left[M_{33} \right]$$

and



We can find new H, F, G, E from the formula in (1).

Since our present study is 3 region 35 industry I-O matrices, we stop after 2nd iteration. For m regions n industry I-O matrices, we need to stop after (m-1)th iterations.

4. (b) Subroutine DMINV (A, N, D, L, M)

input = A, N

output = D

utility = L, M

5. Subroutine WLNC (W, C, Z, N, M, N1)

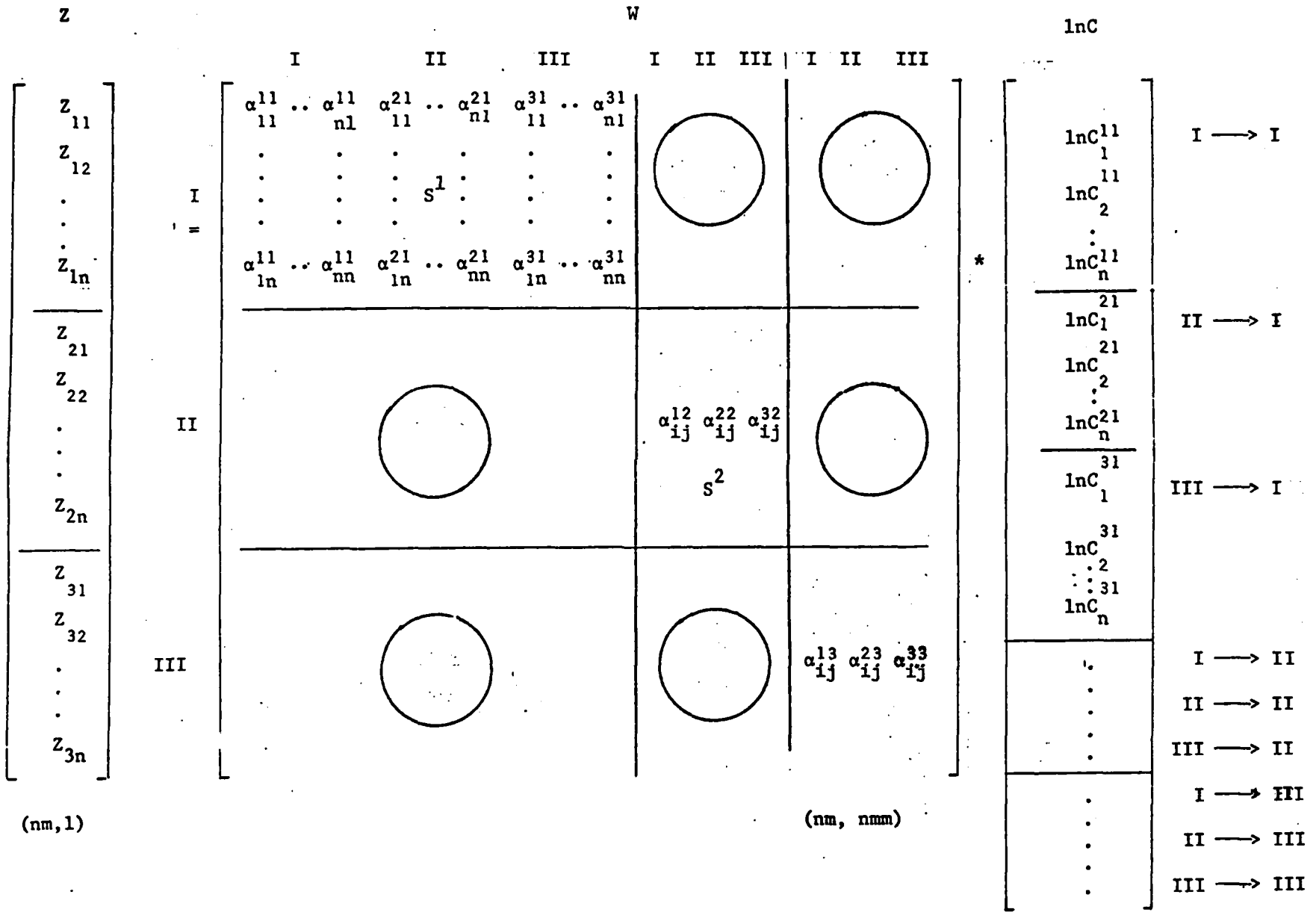
input = W, C, N, M, N1

output = Z

Subroutine WLNC computes the weighted rate of change in transportation costs.

$$Z = W * \ln C$$

$$(nm, 1) \quad (nm, nmm) \; (nmm, 1)$$


Z
W
lnC
I
II
III
I
II
III
I
II
III
Z_{11}
Z_{12}
Z_{1n}
Z_{21}
Z_{22}
Z_{2n}
Z_{31}
Z_{32}
Z_{3n}
α^{11}_{11} .. α^{11}_{n1} α^{21}_{11} .. α^{21}_{n1} α^{31}_{11} .. α^{31}_{n1}
α^{11}_{1n} .. α^{11}_{nn} α^{21}_{1n} .. α^{21}_{nn} α^{31}_{1n} .. α^{31}_{nn}
S^1
α^{12}_{ij} α^{22}_{ij} α^{32}_{ij}
S^2
α^{13}_{ij} α^{23}_{ij} α^{33}_{ij}
lnC^{11}_1
lnC^{11}_2
lnC^{11}_n
lnC^{21}_1
lnC^{21}_2
lnC^{21}_n
lnC^{31}_1
lnC^{31}_2
lnC^{31}_n
I ⟶ I
II ⟶ I
III ⟶ I
I ⟶ II
II ⟶ II
III ⟶ II
I ⟶ III
II ⟶ III
III ⟶ III
(nm,1)
(nm, nmm)
(nmm, 1)

where $Z_{11} = \alpha^{11}_{11} \ln C^{11}_{1} + \alpha^{11}_{21} \ln C^{11}_{2} + \ldots + \alpha^{11}_{n1} \ln C^{11}_{n} + \alpha^{21}_{11} \ln C^{21}_{1} + \alpha^{21}_{21} \ln C^{21}_{2} +$

$\ldots + \alpha^{21}_{n1} \ln C^{21}_{n} + \alpha^{31}_{11} \ln C^{31}_{1} + \alpha^{31}_{21} \ln C^{31}_{2} + \ldots + \alpha^{31}_{n1} \ln C^{31}_{n}$

in general

$$Z_{ij} = \sum_{r=1}^{m} \sum_{k=1}^{n} \alpha^{ri}_{kj} \ln C^{ri}_{k} \quad \text{(for } i = 1,2,3 \text{ and } j = 1,2, \ldots, n\text{)}$$

6. Subroutine TCHNGE (TCC, ICC, C, I, J, K, N, M)

input = TCC, ICC, I, J, K, N, M

output = C

Subroutine TCHNGE assigns selected transport cost changed industries among the regions and computes the transport cost changes in dollars.

7. (a) Subroutine PCHNGE (A, B, DP, N, M, U1)

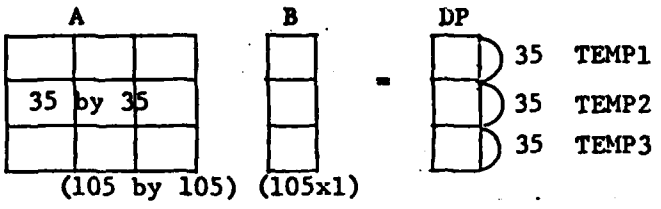
input = A, B, N, M, U1

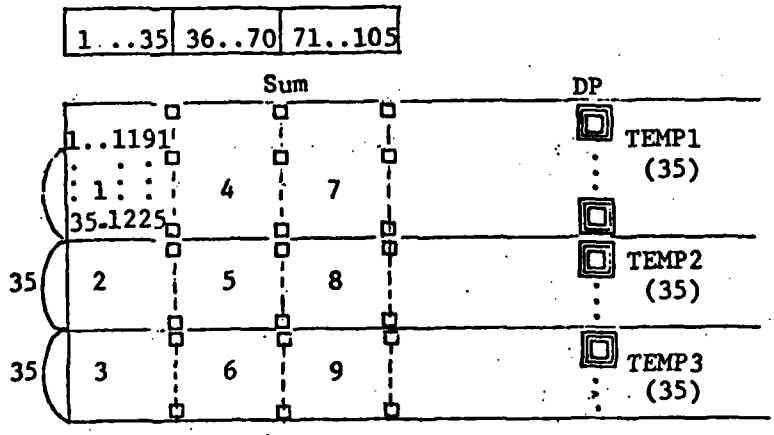
output = DP

Subroutine PCHNGE computes the multiplication of partitioned matrices with partitioned vector to get partitioned vector.

$$\underset{DP}{d\ln P} = \underset{A}{(I-S)^{-1}} * \underset{B}{W d\ln C}$$

Subroutine PCHNGE is used to compute rate of change in regional output prices.





where ▣ = raw sum of block matrices.

7. (b) Entry ATB (A, B, DP, N, M, U1)

Entry ATB computes A′ B, where A′ is the transpose of block matrix and B is a block vector.

8. Subroutine MULTCO (B, C, D, A, N, M, N1, N2)

input = B, C, D, N, M

output = A, N2

Subroutine MULTCO computes new multiregional variable I-O coefficients.

$$\underset{(105)}{\text{dln } a_{ij}^{sr}} = \underset{(105)}{\text{dln } p_j^r} - \underset{(315)}{\text{dln } C_i^{sr}} - \underset{(105)}{\text{dln } p_i^s}$$

$$a_{ij}^{sr}(t_1) = a_{ij}^{sr}(t_o)\ \text{Exp}(\text{dln } p_j^r - \text{dln } C_i^{sr} - \text{dln } p_i^s)$$

9. (a) Subroutine DECOMP (A, B, C, N, M, N1, N2)

input = A, N, M, N1

output = B, C, N2

Subroutine DECOMP writes new a_{ij}^r on file N2 and it also writes trade coefficients by decomposing a_{ij}^{sr} after calling DCOMPJ.

(b) Subroutine DCOMPJ (A, B, C, NS, J, N, M, N1)

input = A, NS, J, N, M, N1

output = B, C

Subroutine DCOMPJ decomposes a_{ij}^{sr} into a_{ij}^{r} and t_i^{sr} by using the following formulas.

$$\sum_{s=1}^{3} a_{ij}^{sr} = a_{ij}^{r}$$

$$\frac{a_{ij}^{sr}}{a_{ij}^{r}} = t_{ij}^{sr}$$

$$\frac{1}{n} \sum_{j} t_{ij}^{sr} = t_i^{sr}$$

10. Subroutine MULT (A, B, C, N, M, NU1, NU2, NU3)

input = A, B, N, M, NU1, NU2

output = C, NU3

Subroutine MULT computes the partitioned multiplication A·B=C

$$\begin{bmatrix} A & & \\ \hline A^{11} & A^{12} & A^{13} \\ \hline A^{21} & A^{22} & A^{23} \\ \hline A^{31} & A^{32} & A^{33} \end{bmatrix} * \begin{bmatrix} B & & \\ \hline B^{11} & B^{12} & B^{23} \\ \hline B^{21} & B^{22} & B^{23} \\ \hline B^{31} & B^{32} & B^{33} \end{bmatrix} = \begin{bmatrix} C & & \\ \hline C^{11} & C^{12} & C^{13} \\ \hline C^{21} & C^{22} & C^{23} \\ \hline C^{31} & C^{32} & C^{33} \end{bmatrix}$$

where each cell is a matrix of 35 by 35 elements.

11. Subroutine RAS (A, U, V, R, S, N1, N2, XA, T, IR, ERR)

input = A, U, V, N1, N2, ERR

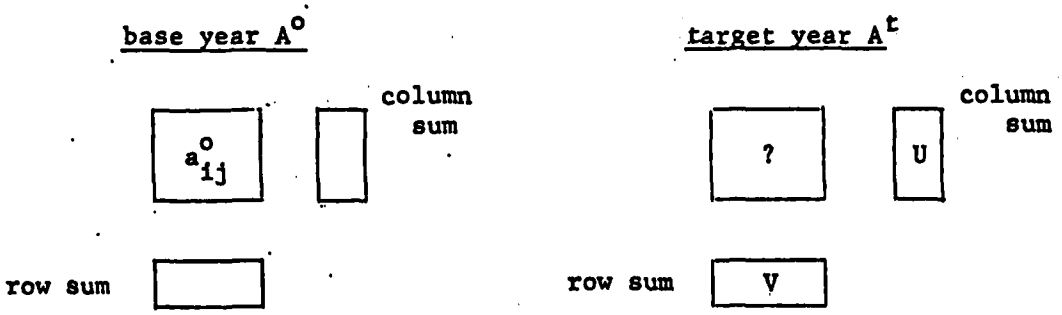
output = R, S, XA, IR

utility = T

Subroutine RAS estimates each elements of trade flow matrices of the target year 1972. The RAS requires a base year 1963 data (A) and target year row sums(V) and column sums(U).

The RAS is computed as follows:

(ref: Bacharach, M. Biproportional Matrices and input-output change, Cambridge, 1970)



$$(1)\quad r_i = \frac{U_i}{\sum_j a^o_{ij}}$$

$$(2)\quad a^1_{ij} = r_i\, a^o_{ij}$$

$$(3)\quad s_j = \frac{V_j}{\sum r_i \cdot a^o_{ij}}$$

$$(4)\quad a^2_{ij} = r_i \cdot a^o_{ij} \cdot s_j$$

(5) If $\left|\, \text{Min}\{r, s\} - 1 \,\right| \leq \varepsilon$, then stop.

Otherwise, set $a^o_{ij} = r_i\, a^o_{ij}\, s_j$

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